VOL. 26

The BULLETIN

American Society of Hospital Pharmacists

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The BULLETIN
American Society of Hospital Pharmacists

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MEMBERSHIP in the American Society of Hospital Pharmacists and the American Pharmaceutical Association is open to all practicing Hospital Pharmacists. With membership is included subscriptions to THE BULLETIN of the American Society of Hospital Pharmacists and to the two *Journals* of the American Pharmaceutical Association, as well as the several services of both organizations.

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IN THIS ISSUE

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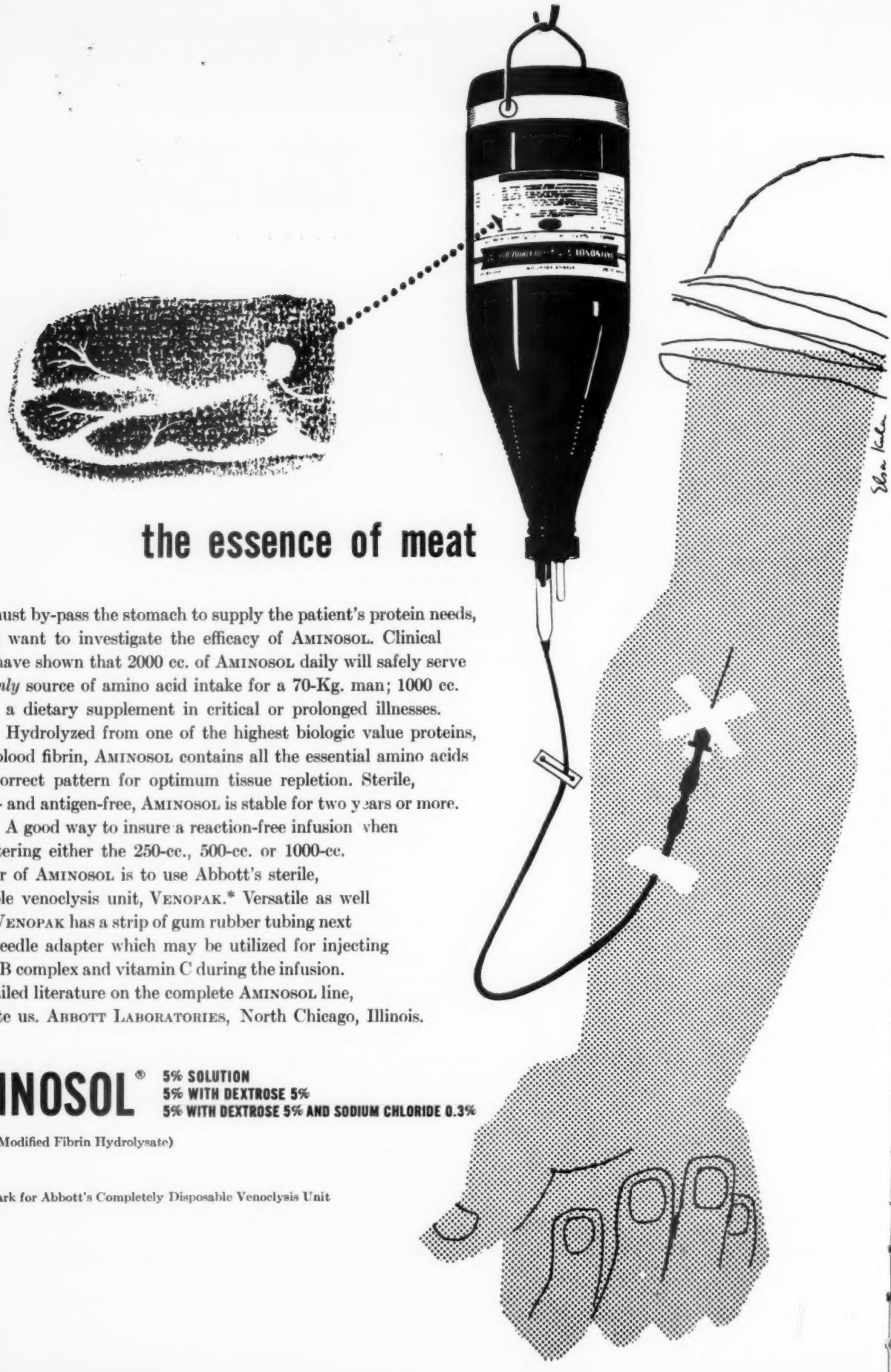
a.L.H



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AMERICAN PHARMACEUTICAL ASSOCIATION

WITH the appearance of THE BULLETIN in its present form, the American Society of Hospital Pharmacists marks another milestone in its progress. Once again this group demonstrates that cooperation, enthusiasm and the will to do things constitute a success formula that effectively promotes the interests of all concerned.

The American Pharmaceutical Association, with which the A.S.H.P. is affiliated, is happy to see the Society progressing so satisfactorily and so rapidly. After all, it was but a few years ago that all of the things which are now realities in hospital pharmacy in the United States were but dreams or visions in the minds of those who look upon this specialty as their particular avenue for advancing the profession we all serve.

Dreaming and envisioning are the privileges of all, but it takes a good bit of doing to make dreams and visions come true. The important thing about the A.S.H.P. is that it numbers, within its ranks, dreamers who can make their dreams come true. They follow through and they produce—slowly sometimes, but surely always.

We join you in taking pride in your achievements and we congratulate the editors of this BULLETIN on having accomplished so much in so short a time. Like the parent association from which the A.S.H.P. draws much of its inspiration and strong backing, it must expect to serve many who do not take part in its active support and we are glad to have found a way of giving not only moral support to your efforts but substantial practical support as well. This will be continued through the Division of Hospital Pharmacy of the A.Ph.A. which has proved its value as a service feature and rallying point for all activities concerning the development of hospital pharmacy.

We are glad to see advertisers in the *Journals* of the American Pharmaceutical Association joining us in making it possible to issue THE BULLETIN in its new form. Opening these pages to a limited number of the best firms in the industry for their announcements within the restrictions imposed by good taste, high quality products, and distribution on prescription serves both the industry and the profession.

Congratulations to the editors and the members of the A.S.H.P. May the spirit of service and cooperation which have carried us this far remain with us and carry hospital pharmacy to new heights of accomplishment.

American Pharmaceutical Association
GLENN L. JENKINS, *President*
ROBERT P. FISCHELIS, *Secretary*

LETTERS

Hexachlorophene

DEAR SIRS: It is our understanding that in the March-April, 1949, (6:51) issue of your BULLETIN, there is published an article on Hexachlorophene (G-11) as a skin germicide.

We are desirous of obtaining an issue of this BULLETIN, or would be open to suggestion as to how we might obtain a reprint.

W. KEDZIE TELLER

The Columbus Laboratories
Chicago, Ill.

Pharmacy In Japan

DEAR SIRS: In July last year, we pharmacists were very glad to have the opportunity to greet the delegates of the Japan pharmacologists, Academy Convention. Furthermore, on September 23, the Delegation Report was delivered to us by Brigadier General Sams, Public Health and Welfare officer of General Headquarters. Today we are able to proceed into the fields of our new objectives with a more firm step.

At present, I am the head of the pharmacy department of a national hospital located in a little town of Northern Japan. I am trying my very best to improve the management of the hospital. We, the citizens of the defeated nation, must make effort to reconstruct a cultural nation by understanding the means of democracy.

I am 30 years old and I am always striving to spread the objectives of public health not only to the hospitals, but also to the citizens of our town. Of course, my pharmacy includes laboratories, and pharmaceutical rooms, and these facilities are improving day by day. I am trying my best to bring forth the best results, but I regret very much that we do not have gas in this area on account of being located in a remote region. Therefore, we are compelled to be satisfied with air-gas installations.

Recently, the Welfare Ministry held a lecture meeting regarding the administration of hospitals, and at present the procedures published by MacEachern are being transacted in our hospitals. There was no special reference for the management of the pharmacy; therefore, we are now undergoing many hardships and are solving our problems through our own experiences.

Recently, our Managing Officer inquired as to whether I had any worthwhile data, but since medical literature from America is not easy to obtain these days and our town being located in such remote region, we face many difficulties in order to obtain them. This is the situation at present.

Therefore, I wish to make a request for some recent references concerning various prescriptions of hospital use, prescriptions for hospital registration (appointment), and materials for the pharmacy. I have enclosed, herewith, some pictures of the members of our pharmacy staff and of our various laboratories.

I believe that, in the future, there will be other problems and matters which I may again beg for your favor. I will appreciate very much for your kind advice, informations, and assistance.

ROKURO HARA

Mura Matsu National Hospital
Nakakanbaragun Nigotaken, Japan

Appreciation

DEAR SIRS: Mr. Leo F. Godley has been appointed chief pharmacist for our hospital and will begin his work here January 1.

I wish to express my deep appreciation for your assistance and that of THE BULLETIN in making contact with Mr. Godley through the notice. I feel he is just the type of man we need to develop a high quality pharmacy for our situation.

W. C. PERDEW, *Superintendent*
Bronson Methodist Hospital
Kalamazoo, Mich.

Sodium r-Lactate Injection

DEAR SIRS: Will you please send me a copy of the publication which appeared in THE BULLETIN OF THE AMERICAN SOCIETY OF HOSPITAL PHARMACISTS 2:104-109 (1945). The article is entitled "Preparation of Injections of Sodium r-Lactate." I am very much interested in the articles since physicians in our country are interested in administering this solution.

Thanking you in advance, I remain at your disposition for anything you need from our country.

MARCELO TABAH

Barcelona, Spain

EDITORIAL

Recent Developments in Hospital Pharmacy

by Don E. Francke

Several progressive steps have been taken which indicate progress in hospital pharmacy. We now have a hospital pharmacist as part-time director of the Division of Hospital Pharmacy and for this we are indebted to many groups, including The Council of the American Pharmaceutical Association, The Executive Committee of the Society, and The Policy Committee of the Division, all of whom worked hand in hand to devise a plan whereby hospital pharmacy could progress another step in its development. It should be emphasized that this is but an interim arrangement which will lead finally to the appointment of a full-time director of the Division. On the other hand, all concerned felt that the appointment of a part-time director was a desirable and necessary step in the development of The Division of Hospital Pharmacy.

It remains to be seen how much can be accomplished by a director devoting a portion of his time to the many tasks that need to be done in hospital pharmacy. The director is indeed fortunate to have the opportunity to call on Dr. Fischelis, secretary of the American Pharmaceutical Association for help and guidance for he is a man of the broadest experience in matters pharmaceutical and it would be unfortunate if the abilities of such an individual were not utilized. It is also very gratifying to have the capable assistance of Gloria Niemeyer who as assistant director of the Division has shown outstanding capabilities and who will be depended upon to implement many of the new and to continue the established functions of the Division. In addition, she will continue to carry a major portion of the responsibility of THE BULLETIN, as she has done so well these past five years.

Whether or not your publication has been improved in appearance and in the quality of articles carried, you have probably judged for yourself by now. As this is being written we have high hopes that these improvements will be self-evident. The changes which have been made have taken considerable time and coordinated planning, and we have received splendid cooperation from the members of the editorial staff. Those few of you who are charter members of the Society can appreciate probably more fully the growth and development of THE BULLETIN than can the newer members. We would want you to believe, as we do, that this is but another progressive step in the development of your publication. Five years from now we anticipate that the contrast between our publication then will be as great as between the present one and that of 1945.

This year we shall see also the final adoption of the Minimum Standard For Pharmacies In Hospitals by the several organizations concerned. It is a slow process to first reach an agreement among our own group and then to gain final adoption of the standard by the several other organizations concerned. We expect that not only will approval be obtained, but that a study will be made of the application of the standards to hospitals of various size and type.

The Institute on Hospital Pharmacy is again scheduled, this year in Ann Arbor, Michigan. These institutes are undoubtedly the best educational programs in pharmacy for practitioners, and have been of untold value in raising the standard of the practice of pharmacy in hospitals. Each year we find people coming to these institutes, catching the prevailing enthusiasm and then returning to their hospital to implement many progressive changes.

Steps will be taken to evaluate and standardize internships in hospital pharmacy. There is a definite need for both academic and non-academic internships, but it is also necessary and desirable to guide these programs in such a way as to provide a certain basic level of training for those who wish to make a career of hospital pharmacy. We feel certain that these measures will be welcomed by all who offer internships and certainly by the interns themselves.

It is too early to forecast what measure of success the Division will have in 1950. All of these projects are important, as are others which have not been mentioned. They can be accomplished only by teamwork. The Society, the Division, the affiliated chapters and you, the individual members, must work as a unit. Each can contribute in areas the other cannot reach. Through coordinated teamwork we may look forward to 1950 as an outstanding year in the progress in hospital pharmacy.

A valuable vehicle and solvent which may, in the future, be used more extensively in compounding a wide variety of pharmaceuticals. Some of its potentialities are illustrated here

PROPYLENE GLYCOL

by

DARWIN L. HEINE

PAUL F. PARKER

DON E. FRANCKE

PROPYLENE glycol, a dihydroxyl alcohol, first came to the pharmacists' attention after the beginning of the second World War. Since then it has grown into use to such an extent that it is now a part of the everyday armamentarium of the practicing pharmacist. The fact that propylene glycol can be used internally, together with several other favorable attributes, makes it unique among the glycols and of tremendous interest to a hospital pharmacist.

Propylene glycol was first described by Wurtz in 1859;[1] however until a few years ago it was merely a curious compound of the research laboratory. Today it is used widely in cosmetics, pharmaceuticals, foods, and plastics.

PHYSICAL PROPERTIES

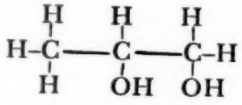
Propylene glycol is a clear, colorless, viscous liquid having a slightly acrid taste and is practically odorless. It is more hygroscopic than glycerin, which makes it easily adaptable as a softening and moistening agent. Propylene glycol is miscible with water, acetone and chloroform in all proportions, thereby lending its use to a wide variety of preparations. It is soluble in ether. Propylene glycol will dissolve either completely, or to an extent necessary for compounding, such a wide variety of substances as the following: several sulfa drugs, antipyrine, phenobarbital sodium, pentobarbital sodium, paraldehyde, benzocaine, hexylresorcinol, thymol, menthol, camphor, vitamins A and D, diethylstilbestrol, and a wide variety of essential oils. It should, however, be noted that it is immiscible with fixed oils.

Its freezing point is –75 degrees F., which makes it advantageously usable as an antifreeze. Furthermore, when it does freeze it does not form crystals, but sets to a glass-like solid. Since none of the glycols expand upon freezing, there is no danger of breaking containers or pipes. The fire point of propylene glycol is 215 degrees F. Since the fire point is above the boiling point of water, it presents few problems in storage or handling. Under the usual conditions of storage, propylene glycol is quite stable, but at high temperature it tends to oxidize and give rise to such products as propionaldehyde and lactic acid. It may be considered negligible as a fire hazard.[2]

DARWIN L. HEINE is pharmacist supervisor, PAUL F. PARKER is an intern and graduate student in hospital pharmacy and DON E. FRANCKE is chief pharmacist, all at the University of Michigan Hospital, Ann Arbor.

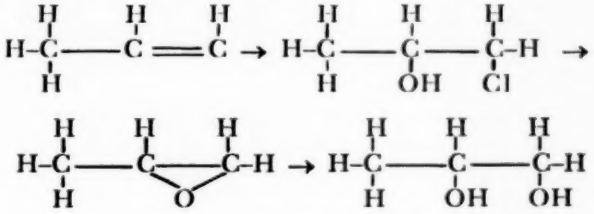
CHEMISTRY

When an alcohol contains two hydroxyl groups, it is known as a glycol. For example, when a second hydroxyl group is introduced into ethyl alcohol, the resulting product is known as ethylene glycol. Similarly, the addition of a second hydroxyl group to *n*-propyl alcohol gives the product, propylene glycol. The presence of these two hydroxyl groups greatly increases the ability of glycols to take up and hold moisture from the atmosphere, raises their boiling points approximately 100 degrees C., and decreases correspondingly their evaporation rates.



Propylene Glycol
Propanediol–1,2
1,2–Dihydroxypropane

Propylene glycol may be obtained by the hydrolysis of propylene, a by-product in the refining of petroleum and the cracking of natural gas. This is accomplished by treating propylene with alkaline permanganate or with hypochlorous acid. The former method must be carefully controlled since the alkenes are very sensitive to the action of oxidizing agents. Alkaline permanganate is more mild in action than acidic permanganate, but even so the reaction must be carried out at zero degrees C. The latter method is used largely on a commercial basis.



The glycols are readily oxidized by either potassium permanganate, chromic acid or potassium dichromate, particularly in acid solution.

As is characteristic of the other glycols, propylene glycol forms esters, ethers, metallic glycollates and other derivatives.

PHARMACOLOGY

The chronic toxicity of propylene glycol was studied over a 24 month period by Morris, Nelson and Calvery.[3] No damage to the kidney in concentrations of 2.4 and 4.9 per cent was noted, whereas urinary calculi were found upon the administration of ethylene glycol. Lepkovsky, Over, and Evans have also found by histological examination that propylene glycol has no kidney toxicities.[4] The possibility of liver damage was investigated by Newman, Van Winkle, Kennedy, and Morton and it was found to be less injurious and less objectionable than ethyl alcohol and other glycols.[5] A number of investigators have confirmed the low toxicity of propylene glycol.[6,7,8] The fatal dose for rats is considerably higher with propylene glycol than with glycerin.

TABLE 1
AVERAGE ACUTE FATAL DOSE OF PROPYLENE GLYCOL AND GLYCERIN FOR RATS

	Gm. per Kg.	
Route of Administration	Propylene Glycol	Glycerin
Orally	33.5	
Subcutaneously	22.5	15.1
Intramuscularly	14.0	7.6
Intravenously	6.8	

The symptoms of acute toxicity following the injection of large amounts of propylene glycol are increased respiration and general motor depression.

Propylene glycol is rapidly absorbed from the gastrointestinal tract, especially in the jejunum. There is little absorption from the stomach. After absorption it is rapidly distributed throughout the tissues. Propylene glycol causes a decrease in oxygen consumption and production of carbon dioxide, but increases glycogen of the liver and lactic acid content of the blood. Since the metabolism of propylene glycol produces normal body constituents, it logically may be assumed that it enters the carbohydrate cycle and therefore may be thought of as a food-like substance. In fact, Hanzlik, Lehman, Van Winkle, and Kennedy have shown that gram for gram, propylene glycol produces one and one-half times as much energy as dextrose.[9]

In animals propylene glycol produces a definite diuretic action. The narcotic effect is about one-third that produced by ethyl alcohol. None of these effects are noteworthy, however, when used in amounts comparable to those which would be given if the propylene glycol were being used as a vehicle in medications.

Upon injection of propylene glycol undiluted there is a marked burning sensation, however, a diluted solution may be used as a solvent for injections with only little or no irritation.

PHARMACEUTICAL APPLICATIONS

Propylene glycol has for some years been in an unfortunate position, simply because it is one of a family which some time ago gained a poor reputation. Although ethylene glycol has been known to be extremely toxic because it is metabolized to oxalic acid, this should not affect the use of propylene glycol, which has been shown conclusively to have none of the disadvantages exhibited by other members of the glycols. Due to a need for a replacement for glycerin, propylene glycol was studied extensively during the recent war. These studies have led not only to a suitable replacement for glycerin, but also to a new solvent and vehicle which has an extremely wide range of applicability in the pharmaceutical industry. Actually, propylene glycol may now be considered among the standard list of pharmaceutical adjuncts.

To so firmly establish propylene glycol in the pharmacists' armamentarium required a more extensive than usual pharmacological study. This has shown propylene glycol to have little or no toxicity. Now it must be tried in every phase of its potential pharmaceutical applicability. This is a never ending process. It may be adaptable as a solvent or vehicle in the pharmacy of new drugs. It may extend or broaden the use of old drugs by making them available in new forms. These increased uses of propylene glycol would be greatly assisted if the U.S.P. and N.F. included in their monographs, statements of solubilities in this important solution. The table on the following page lists the solubility of several drugs in propylene glycol.

Not only is there a broad future in the applicability of propylene glycol, but already there are many established pharmaceutical applications, each of which may be broadened into an entirely new and complete field. Kelly, Steinmetz and Green in 1942 reviewed some of the uses of propylene glycol with the suggestion that it be adopted as a glycerin substitute during the war.[10] The use of propylene glycol as a replacement for glycerin in a large number of preparations became official in 1943 in a supplement to N.F. VII.

Germicides

The widest range of applicability of propylene glycol stems from its broad solvent properties. Let us here consider some of the germicides which are soluble in propylene glycol. Among these are cresol, phenol, and hexylresorcinol. This opens a field of usefulness which has a twofold advantage; first, the antiseptic may exert its bactericidal action and, secondly, the solvent itself has excel-

TABLE 2

SOLUBILITY OF PHARMACEUTICALS IN PROPYLENE GLYCOL, N.F.

(Temperature=77°F.)

Material	Per cent Solubility
DRUGS AND MEDICINALS	
Acetanilide	2.09
Acetarsone	0.52
Acetphenetidine	2.10
Aloin	4.37
Antipyrine	>55.00
Caffeine	0.77
Chloral Hydrate	>89.00
Ethyl Carbamate	>57.00
Glycine	< 0.45
Hexamethylene Tetramine	11.22
o-Hydroxybenzyl Alcohol	44.10
Paraldehyde	∞
Pepsin	< 0.08
Phenobarbital (Luminal Sodium)	>49.00
Resorcinol	55.70
Sodium Bismuth Thioglycolate	9.4
Sodium Iodobismuthite	6.
Sulfadiazine	0.3
Sulfanilamide	7.25
Sulfapyridine	0.50
Sulfathiazole	1.71
Terpin Hydrate	18.20
Urea	22.20
LOCAL ANESTHETICS	
Benzocaine	12.20
Benzyl Alcohol	∞
Diothane	5.
Salicyl Alcohol (Saligenin)	4.
ANTISEPTICS	
Camphor	9.80
Calcium Sulfocarbolate	>30.00*
Chlorothymol	70.00
Hexylresorcinol	>80.00*
Menthol	>50.00
Merthiolate	>29.00
Metaphen	< 0.27
Salol	10.50
Thymol	>50.00
Trichloro-tert-butanol	>60.00
Zinc Sulfocarbolate	>39.00*
VITAMINS AND HORMONES	
a-Estradiol	mg. per cc. 0.5
Ascorbic Acid	8.16
Calcium Pantothenate	2.04
Nicotinic Acid	0.88
Pyridoxine Hydrochloride	2.73
Riboflavin	< 0.006
Thiamine Hydrochloride	5.14
Vitamin A (12% in oil)	insol.
ORGANIC SUBSTANCES	
Acacia Gum	< 0.16
Calcium Glycerophosphate	< 0.07
Cetyl Alcohol	0.23
Pectin	insol.
Phenothiazine (Purified)	< 1.15
Sodium Citrate	0.23
Tannic Acid	>45.20*
INORGANIC SUBSTANCES	
Arsenious Acid	insol.
Cupric Oxide	insol.
Ferric Oxide	insol.

* Viscosity of solutions prevented further additions of solid.

∞=Miscible or soluble in all proportions.

The Dow Chemical Company, Midland, Michigan

lent germicidal properties. Shepherds Industries, Ltd., have taken advantage of the solubility of hexylresorcinol in propylene glycol by patenting a 1:9 mixture which can be used successfully as a germicidal aerosol which is said to be less toxic and more persistent than comparable aerosols.[11] It is interesting to note here that propylene glycol alone as an aerosol in concentrations as low as 1:3,000,000 has been effective in killing the virus of Influenza A.[12] Propylene glycol has been used in other antiseptic capacities such as a vehicle in surgical instrument sterilizing solutions. Oral thermometers are as effectively sterilized with full strength propylene glycol as with isopropyl alcohol or ethyl alcohol.[13] Propylene glycol has an added advantage of being the least volatile. The collective advantages of its potency, solubilizing properties, low volatility, and penetrability offer a wide range of opportunity with respect to antiseptic, bactericidal, and insecticidal preparations. The following formulas are useful in the sterilization of surgical instruments, especially since they cause little or no rusting.

INSTRUMENT ALCOHOL FORMULAS

Propylene Glycol	900.0 cc.
Saponated Solution Cresol	360.0 cc.
Isopropanol 99%, to make	18,000.0 cc.
Solution Gentian Violet, 0.05%	5.0 cc.
Propylene Glycol	900.0 cc.
Isopropanol 99%, to make	18,000.0 cc.

Since propylene glycol is bactericidal, its value as a preservative naturally follows. The preservative action of propylene glycol has been shown to excel that of glycerin by innoculating plates containing various concentrations of propylene glycol and glycerin in a medium containing agar, malt extract, yeast extract, and water.[14] These plates were seeded with various mold growths and it was shown that propylene glycol was effective in stopping growth in a concentration one-fourth that of glycerin.

Replacement for Glycerin

Because of its solvent properties, miscibility with water and alcohol, preservative action and non-volatility, Kelly, Steinmetz, and Green suggested that glycerin be replaced by propylene glycol in a large number of N.F. VII elixirs.[10] Some of these include Aminopyrine Elixir, Barbital Elixir, Calcium and Sodium Glycerophosphates, Elixir, Iron, Quinine, and Strychnine Phosphates Elixir, Gentian Elixir, Glycerinated Gentian Elixir and Terpin Hydrate Elixir. Dean and Brodie found that the most satisfactory replacement for glycerin in Phenobarbital Elixir U.S.P. XIII is propylene glycol.[15] The glycerin may be replaced completely or in part to give a satisfactory product; however, when replaced completely, the specific gravity is somewhat lower than that of the official product. A satisfactory formula suggested on the basis of color, taste, odor, viscosity, specific gravity, stability, and general acceptability is as follows:

PHENOBARBITAL ELIXIR

Phenobarbital	4.0 Gm.
Sweet Orange Peel Tincture	30.0 cc.
Amaranth Solution	10.0 cc.
Alcohol	125.0 cc.
Propylene Glycol	450.0 cc.
Syrup	150.0 cc.
Distilled Water, to make	1000.0 cc.

The preservative properties have also led to work indicating that propylene glycol may be satisfactorily used in the preparation of a number of N.F. VII syrups including Ammonium Hypophosphite Syrup, Calcium Lactophosphate Syrup, and Hypophosphites Syrup.[16]

Rae has shown that propylene glycol may be used in some cases to a distinct advantage in the preparation of tinctures and fluidextracts.[17] From his experiments it has been shown that propylene glycol satisfactorily extracts vegetable drugs containing tannins, saponins, and anthraquinone derivatives, in the last instance being superior to alcohol. It is also a good solvent for the extraction of morphine from opium; however, it should be pointed out that it is not desirable in extracting the acidic principles of balsam of tolu. The above groups of drugs could be extended to include a large number of substances in which the glycerin, alcohol, or both, could be replaced. They might include Compound Gambir Tincture, Hamamelis Leaf Fluidextract, Tannic Acid Glycerite, and Tannic Acid Ointment in the tannins; Rhubarb Extract, Rhubarb Fluidextract, Rhubarb Tincture, Aromatic Rhubarb Tincture, Aloe Tincture, Cascara Sagrada Fluidextract, and Senna Fluidextract in the anthraquinones and Senega Fluidextract in the saponin group. Alcohol may also be replaced by propylene glycol in the preparation of Ethyl Nitrite Spirit. In Brown's experimental work on the latter preparation, the spirit made with propylene glycol lost only 10 per cent of ethyl nitrite by volatilization after a storage period of thirty-nine days, while the control solution lost 61 per cent.[15]

Parenteral Solutions

Propylene glycol has also been used in solutions for injection, particularly for its solvent and preservative qualities. The following formulas illustrate the use of propylene glycol with barbiturates.

STERILE SOLUTION PENTOBARBITAL SODIUM, 0.150 Gm. per cc.

Pentobarbital Sodium	15.0 Gm.
Benzyl Alcohol	2.0 cc.
Propylene Glycol	60.0 cc.
Water for Injection, to make	100.0 cc.

STERILE SOLUTION AMYTAL SODIUM, 0.250 Gm. per cc.

Amytal Sodium	25.0 Gm.
Benzyl Alcohol	2.0 cc.
Propylene Glycol	60.0 cc.
Water for Injection, to make	100.0 cc.

STERILE SOLUTION PHENOBARBITAL SODIUM, 0.150 Gm. per cc.

Phenobarbital Sodium	30.0 Gm.
Benzyl Alcohol	4.0 cc.
Propylene Glycol	120.0 cc.
Water for Injection, to make	200.0 cc.

In preparing each of the above, boil the water to liberate carbon dioxide, thereby preventing precipitation of the free barbiturate. Dissolve the active ingredient in the propylene glycol, add the benzyl alcohol and water for injection. Filter through a bacterial filter using aseptic technic throughout, and fill into sterile vials. Barbiturate salts are decomposed by heat and must be prepared aseptically. The finished product may be injected either intramuscularly or intravenously.

Antibiotics

The use of antibiotics in conjunction with propylene glycol is at the present time in the stage of investigation. There is a question of whether or not antibiotics are inactivated by propylene glycol; there is the possiblity that some may be inactivated whereas others may not or, there may be other factors which may or may not influence inactivation. Pulaski reports that penicillin is inactivated by propylene glycol, but that it was not inactivated when the glycol was combined with a Carbowax base.[18] This investigator notes, however, that ointments containing penicillin should be kept refrigerated and dressings should be changed at least once daily.

Tyrothricin has also been used in preparations containing propylene glycol with no known report of inactivation. A formula illustrating this preparation is:

TYROTHRICIN SOLUTION

Tyrothricin	0.05 Gm.
*Nacconal, F.S.N.O.	1.0 Gm.
Propylene Glycol	10.0 cc.
Sterile Distilled Water, to make	100.0 cc.

* Nacconal F.S.N.O. is a special pharmaceutical grade of a sodium mixed alkyl aryl sulfonate and may be obtained from the National Aniline and Chemical Company.

Prigal and Furman report the use of bacitracin in aerosol form containing propylene glycol for sino-respiratory infections and find no evidence of inactivation of bacitracin by propylene glycol.[19]

Whether we can in the future indiscriminately use antibiotics in preparations containing propylene glycol can be determined only after further study. Aerosol preparations and substances for topical application which contain propylene glycol with a wetting agent would be especially desirable adjuncts to therapy.

Sulfonamides

Blackford has described the use of propylene glycol solutions of sulfathiazole in otolaryngology.[20] Unusual results were obtained with a 3 per cent solution when used in either of three ways: the drainage wick inserted following incision was saturated with the solution, tampons saturated with the solution were placed on either side of the nose 10 to 15 minutes following sinus operations, or 5 cc. of the solution were instilled into the maxillary sinus following irrigation. Tympanide, prepared by Warren-Teed Products Company, Columbus, Ohio, for the treatment of otitis media and infections of the external ear has the following formula:

Sulfanilamide	5.0 Gm.
Urea	10.0 Gm.
Chlorobutanol	3.0 Gm.
Propylene Glycol, to make	100.0 cc.

A water-soluble jelly containing a sodium sulfa drug and propylene glycol has been described which is easily prepared:[21]

SULFAJEL

Sodium Sulfite	0.2 Gm.
Sodium Sulfa Drug	5.0 Gm.
Propylene Glycol	15.0 cc.
Ethyl Parasept	0.1 Gm.
Methyl Cellulose	4.0 Gm.
Distilled Water, to make	100.0 cc.

The use of sulfonamide-propylene glycol combinations may be relatively stated to be in its infancy. A number of formulas have been suggested for this combination particularly for aerosol and local therapy. They have shown promise in both treatment and prophylaxis of upper respiratory infections.

Vitamins

Some of the vitamins are soluble in propylene glycol. Drisdol, a product of Winthrop-Stearns, Inc., contains crystalline vitamin D_2 (calciferol) with propylene glycol as the solvent and preservative. The activity of vitamin D is reported to be two or three times greater in propylene glycol than in oil.[22]

Concentrated solutions of ascorbic acid for oral use are easily prepared using propylene glycol as the solvent.

ASCORBIC ACID SOLUTION

50 mg. per cc.

Ascorbic Acid	50.0 Gm.
Propylene Glycol, to make	1000.0 cc.

Alkaloids

The solubility of alkaloids in propylene glycol is noteworthy, especially in view of the fact that in most instances they remain in solution upon dilution with water. Some of these include atropine, codeine, ephedrine and homatropine. These could possibly be used to an advantage in the preparation of eye solutions.

Brass has suggested a formula whereby quinidine may be made injectible.[23]

QUINIDINE INJECTION

Quinidine Hydrochloride	10.0 Gm.
Propylene Glycol, to make	75.0 cc.

The quinidine hydrochloride is placed in a suitable container and enough propylene glycol

is added to make 75 cc.; upon application of heat the quinidine hydrochloride readily goes into solution. When the mixture is cool, sufficient propylene glycol is added to make 75 cc. This preparation is administered by intramuscular injection.

Hormones

A number of hormones have been found to be soluble in propylene glycol; however, at the present time the usefulness of this property has not been fully explored. McGavack and Vogel have discussed the intravenous use of desoxycorticosterone acetate in propylene glycol.[24] The hormone is soluble to the extent of about 10 mg. per cc.; however, upon dilution with water or saline the salt crystallizes out. These workers have described a technic whereby the solution is diluted rapidly by the blood upon slow injection, which apparently has few dangers of emboli formation. The Schering Corporation prepares a 10 mg. per cc. solution, marketed under the name, Cortate, which contains desoxycorticosterone acetate in propylene glycol and 20 per cent absolute alcohol for sublingual use. With the increase in number and uses of hormones, it does not seem unreasonable to believe that there will be an extended usefulness of propylene glycol with these compounds in the future.

Dermatological Preparations

The texture, body and general physical properties of ointments and cosmetic preparations are considerably improved by the use of propylene glycol. It is used as a solvent, carrier, emollient and preservative in these preparations. Hartman and Zopf have shown that when propylene glycol was substituted for glycerin in the formula for Hydrophilic Ointment, U.S.P. XIII, the base did not soften upon levigation as much as did the official formula.[25] Further, when coal tar was incorporated in this base, an excellent preparation was obtained which was stable to heat. A large number of water-soluble bases containing propylene glycol have been developed; the formulas of a few are illustrative.

WASHABLE OINTMENT BASE

Cetyl Alcohol	9.2 Gm.
Stearyl Alcohol	9.2 Gm.
Sodium Lauryl Sulfate	1.5 Gm.
White Petrolatum	30.0 Gm.
Propylene Glycol	10.0 cc.
Distilled Water, to make	100.0 Gm.

BEELER BASE

Cetyl Alcohol	15.0 Gm.
White Wax	1.0 Gm.
Propylene Glycol	10.0 cc.
Sodium Lauryl Sulfate	2.0 Gm.
Distilled Water	72.0 Gm.

SPECIAL WATER-SOLUBLE BASE FOR ACIDS

*Tegacid	150.0 Gm.
Spermaceti	200.0 Gm.
Glycerin	350.0 cc.
Propylene Glycol	350.0 cc.
Distilled Water	300.0 cc.

* Tegacid is the name of an acid emulsifying glycerol monostearate obtainable from the Goldschmidt Chem. Corp., 153 Waverly Place, New York, N.Y.

Hopkins recommended that a Carbowax base be used with a variety of ordinarily insoluble powders such as sulfur, zinc oxide, salicylic acid, sulfanilamide, sulfathiazole, and zinc peroxide.[26] Several of the sulfonamide drugs, salicylic acid and other substances are soluble in the carbowax base containing propylene glycol. Carbowax is the registered trade-mark of the Carbide and Carbon Chemicals Corporation, 30 East 42nd Street, New York, N.Y. A base of this type which is suitable for those medications which are soluble in propylene glycol is as follows:

CARBOWAX BASE

Propylene Glycol	35.0 cc.
Carbowax 1500	25.0 Gm.
Carbowax 4000	40.0 Gm.

Examples of the use of proplyene glycol in pastes which contain insoluble powders are:

ZINC PEROXIDE PASTE

Propylene Glycol	20.0 cc.
Carbowax 1500	40.0 Gm.
Carbowax 4000	20.0 Gm.
Zinc Peroxide	20.0 Gm.

PASTE ZINCLEIM COMPOUND

(Unna's Boot Paste)

Propylene Glycol	2,000.0 Gm.
Gelatin (sheets)	750.0 Gm.
Distilled Water	1,750.0 cc.
Zinc Oxide Powder	250.0 Gm.

ELECTRODE PASTE

Sodium Chloride	300.0 Gm.
Potassium Bitartrate	15.0 Gm.
Butylparaben	0.3 Gm.
Distilled Water	1,000.0 cc.
Tragacanth, powdered	35.0 Gm.
Propylene Glycol	90.0 cc.
Siberian Pine Needle Oil	0.5 cc.
Pumice, powdered	480.0 Gm.

Propylene glycol in combination with a wetting agent and solubilizer has been used in dermatological preparations to assure a high degree of

penetration. This general principle, "the intraderm principle," developed by Hermann, Sulzberger and Baer under a grant from the Wallace Laboratories has been used in the preparation of the following formula which has been described as giving a high percentage of cures for acne vulgaris.[27,28]

INTRADERM SULFUR

Sulfur	7.5 Gm.
*Sodium Mixed Alkyl Benzene Sulfonate	110.0 Gm.
Antipyrine	54.0 Gm.
Triethanolamine	100.0 Gm.
Propylene Glycol	560.0 cc.
Water	168.5 cc.

* A special pharmaceutical grade of a sodium mixed alkyl aryl sulfonate known as Nacconal F.S.N.O may be obtained from National Aniline and Chemical Company.

The "intraderm principle" has also been used in the preparation of a tyrothricin solution for topical application.

The following formula was devised to provide the dermatologist with a liquid, water-soluble vehicle for external application of medicinals to the body.[29] This vehicle is especially useful in treating scalp diseases as it is inconspicuous and easily removed. Many of the commonly used drugs for skin diseases are completely soluble in this vehicle including benzoic acid, salicylic acid, beta-naphthol, chloral hydrate, coal tar solution, menthol, phenol, pilocarpine hydrochloride, resorcin, resorcin monoacetate and so forth. Sulfur and ammoniated mercury may be suspended in it.

Isopropyl Alcohol	20.0 cc.
Propylene Glycol	20.0 cc.
*Tween 20	10.0 cc.
Distilled Water	50.0 cc.
Perfume—As Desired	

* Tween 20 is the trade name for a polyoxyethylene sorbitan monolaurate obtainable from the Atlas Powder Co., Wilmington 99, Del.

Other ointments, emulsions and cosmetic preparations in which propylene glycol has been successfully employed include:

EMULSION OF BENZYL BENZOATE

Stearic Acid	50.0 Gm.
Propylene Glycol	40.0 cc.
Aquaphor	20.0 Gm.
Cetyl Alcohol	20.0 Gm.
Triethanolamine	10.0 cc.
Benzyl Benzoate	500.0 cc.
Ethanol, 15%, to make	1,500.0 cc.

DEODORANT CREAM

*Tegacid	16.0 Gm.
Liquid Petrolatum	4.0 cc.
Spermaceti	5.0 Gm.
Propylene Glycol	15.0 cc.
Aluminum Sulfocarbolate	15.0 Gm.
Distilled Water	42.0 cc.
Cetyl Alcohol	3.0 Gm.

* Tegacid is the trade name of an acid emulsifying glycerol monostearate obtainable from the Goldschmidt Chem. Corp., 153 Waverly Place, New York, N.Y.

DEODORANT AND ANTIPERSPIRANT CREAM

Tegacid	150.0 Gm.
Propylene Glycol	30.0 cc.
Spermaceti	50.0 Gm.
Methyl Parasept	1.0 Gm.
Distilled Water	550.0 cc.
Titanium Dioxide	20.0 Gm.
Aluminum Sulfocarbolate	150.0 Gm.
Boric Acid Powder	50.0 Gm.

Volatile Substances

The choice of propylene glycol for flavoring extracts and emulsions is perhaps best exemplified by vanilla formulations, although the list may be extended to include a wide variety of volatile oils. It has been reported to be particularly useful in preparations containing lemon juice or other fruit juices.[30]

SYNTHETIC EXTRACT OF VANILLA

Vanillin	30.0 Gm.
Coumarin	3.0 Gm.
Alcohol	1,000.0 cc.
Propylene Glycol	400.0 cc.
Caramel	20.0 cc.
Distilled Water, to make	4,000.0 cc.

Stains

A large number of dyes are soluble in propylene glycol, making it useful in the preparation of bacteriological stains. Randolph and Mallery found that the use of propylene glycol as a white blood cell diluting fluid has several advantages.[31] The higher viscosity of the propylene glycol made it easier to fill the counting chamber. It also decreased the rate of evaporation. Blood can be left in the pipette overnight without significant change in the total white blood cell count or staining quality. Incorporation of acid and basic stains which are readily soluble in propylene glycol permits differential staining of eosinophils, polymorphonuclear and mononuclear cells in the counting chamber. Thus one sample of blood only is needed for enumeration of the total white

blood cell count. The Randolph diluting fluid consists of equal parts of two stock solutions.[32]

SOLUTION 1	
Methylene Blue	0.1 Gm.
Propylene Glycol	100.0 cc.

SOLUTION 2	
Eosin B	0.1 Gm.
Distilled Water	100.0 cc.

Other dyes which may in the future have increased usefulness because of their solubility in propylene glycol are trypan blue, caramel, brilliant green and orange G.

Jellies

Formulas including propylene glycol primarily as an anti-mold agent which are being used in hospital pharmacy include:

SURGICAL LUBRICANT	
Tragacanth tears	900.0 Gm.
Propylene Glycol	18,000.0 cc.
Zephiran Concentrate, 12.8%	60.0 cc.
Distilled Water, to make	72,000.0 cc.
Perfume, As Desired	

INDUSTRIAL AND OTHER USES

The use of propylene glycol vapors for bactericidal air sterilization is becoming more and more prominent. Robertson and co-workers employing a concentration of 1:2,000,000 in air, effected complete sterilization of an atmosphere into which as many as 500,000 bacteria per liter of air had been sprayed.[33]

Harris and Stokes proved the efficacy of propylene glycol when in a total of sixty-two ward weeks during the winters of 1941-42 and 1942-43 there was a total of only seven respiratory infections in the experimental wards into which propylene glycol was sprayed, while in the control wards there were 116 respiratory infections.[34]

Because it lowers the freezing point of water solutions, propylene glycol is used in place of brine in various types of refrigeration machines, thereby eliminating the corrosion problem which accompanies the use of brine. Propylene glycol is an ideal antifreeze in equipment for chilling milk and cream, and in brewery cooling systems, because of its lack of odor. Its low toxicity and hygroscopic property make it an ideal humectant for tobaccos. Propylene glycol is also used as a plasticizer and as an esterification agent in the manufacture of paint and varnish resins.

SUMMARY

Propylene glycol is unique among the glycol family in that it may be used internally. This has led to its usage in foods, pharmaceuticals, and cosmetics. The broad solvent properties, bactericidal and preservative action, low volatility, increased penetrability and other desirable physical properties promise a future for propylene glycol comparable to that of such pharmaceutical standards as alcohol and glycerin. A number of formulas are given to illustrate the applicability of these properties.

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The 1950 Annual Meeting

Plans for the annual meeting of the American Society of Hospital Pharmacists have been announced by the program chairman, Mr. J. R. Cathcart. The meeting will be held at the Traymore Hotel in conjunction with the annual convention of the American Pharmaceutical Association April 30–May 5. Beginning on Sunday evening, April 30, the American Society of Hospital Pharmacists will hold a meeting of the House of Delegates with representatives from local affiliated chapters and the executive committee. However, the meeting will be open to all A.S.H.P. members.

Regular business sessions of the hospital group will be held on Monday and Tuesday along with presentation of papers. In addition to the regular reports from committee chairmen and the officers of the Society, there will be a report from the A.Ph.A. Division of Hospital Pharmacy.

Papers to be presented include: "Behind the Scenes in Penicillin Research and Development" by Raymond Rattew, Director of Penicillin Research, Wyeth, Inc.; "Disinfection and Antisepsis: Trends and Ideas" by Elmer G. Klarmann, Vice-President, Lehn and Fink, Inc.; "The Development and Use of Isotopes in Medicine" by John E. Christian, Purdue University, School of Pharmacy; and "Dermatological Vehicles" by E. E. Leuallen, Columbia University, School of Pharmacy.

"Pricing Schedules for Medicaments for Ward, Semi-private, Private and Outpatient Departments" will be the subject of a panel discussion led by C. Rufus Rorem, Executive Secretary, Philadelphia Hospital Council. A staff of hospital pharmacists will be included on the panel.

"What a Hospital Administrator Expects of a Hospital Pharmacist" and "What a Hospital Pharmacist Expects of His Administrator" will be the subjects covered by a representative of each with an opportunity for discussion by the group.

Hospital pharmacists will also want to attend the meetings of the sections of the A.Ph.A. as well as the business sessions during the remainder of the week.

Dr. Purdum Delegate to A.Ph.A.

Dr. W. Arthur Purdum, chief pharmacist at Johns Hopkins Hospital and a past president of the American Society of Hospital Pharmacists, has been appointed the 1950 delegate to the A.Ph.A. House of Delegates representing the Society.

The alternate is Mr. Grover C. Bowles, chief pharmacist at Strong Memorial Hospital in Rochester, N.Y. and Vice-President-Elect of the A.S.H.P.

Antabus as a therapeutic measure to treat alcoholism is presented with considerations to be made when weighing the relative merits of its usefulness

ANTABUS and ALCOHOLISM

by BERNARD E. CONLEY

LIKE so many recent therapeutic innovations, Antabus, a Danish proprietary medicine proposed for the treatment of alcoholism, got off to a bad start in this country. Introduced to the American public via the medical columns of the lay press, the new remedy was heralded as a cure for alcoholism with anti-alcoholic properties so prodigious that patients receiving a single dose of the drug retained a loathing for alcohol for a year. Nothing in the medical literature suggests such prolonged curative powers; in fact, clinical reports show the need for continued daily doses. Such sensationalism serves no purpose other than to create a suspicion in the minds of medical readers of this and other therapeutic agents which are so unfortunate as to receive this type of attention.

In spite of the sensational character of its American debut, Antabus is considered by many to be a promising approach to the medical management of alcoholism. Originally introduced as a purified brand of tetraethylthiuram disulfide by Medicinalco Ltd., Copenhagen, Denmark, it has been widely used in Denmark, Sweden (under the trade name Abstinyl), Finland and Iceland.[1]

The American rights have been acquired by Ayerst McKenna and Harrison, Ltd., New York, who indicate that it is available only for investigational purposes at the present time.[2] The Monsanto Chemical Company, who manufactures and distributes a technical grade of the chemical under the trade name, Ethyl Thiurad, also states that they are supplying a purified grade to ethical pharmaceutical houses and qualified groups of investigators.[3]

The ability of tetraethylthiuram disulfide to lower alcohol tolerance is neither new nor peculiar unto itself. As early as 1914, Koelsch observed a similar reaction to alcohol among industrial workers exposed to cyanamide. Similar observations have since been made among workers exposed to it in industry or in the agricultural use of cyanamide as a fertilizer. More recently Fischer (1945) reported the same phenomenon was caused by the fungus, *Coprinus atramentarius,* to which a poisoning in a Swedish family was attributed.[4] A number of chemicals (metal dithiocarbamates, thiuram sulfides) used as accel-

BERNARD E. CONLEY, formerly a hospital pharmacist, is now secretary of the Committee on Pesticides of the Council on Pharmacy and Chemistry of the American Medical Association.

erators in the vulcanization of rubber have also been observed to possess this unusual property. From this latter source, the so-called alcohol-sensitizing properties of tetraethylthiuram disulfide were noted by Americans.[3,4] It remained for Danish physicians to exploit its medical possibilities.

In addition to its use as a rubber accelerator, tetraethylthiuram disulfide is used as a fungicide for the treatment of seeds. It has also been proposed as a treatment for scabies, intestinal worms and coccidiosis in poultry. It is a colorless or slightly yellowish crystalline powder which has a slightly bitter taste and a weak violet-like odor. It is insoluble in water, sparingly soluble in 96 per cent alcohol and freely soluble in ether and chloroform. The graphic formula is as follows: [5]

$$(C_2H_5)_2\ NC(=S)-S \cdot S-C(=S)N(C_2H_5)_2$$

SYMPTOMS

The ingestion of alcohol following Antabus produces symptoms which are so intense and so unpleasant that the vast majority of patients are induced to abstain from the further use of alcohol while receiving such treatment. The initial sign of impending discomfort begins with a sensation of warmth in the face which progresses to flushing which maximum intensity is reached in about one and one-half hours with facial skin developing a scarlet red color. This is the most obvious symptom and it may extend to the upper part of the arms and chest and in a few persons to the abdomen and thighs. Accompanying this skin reaction are palpitation, a pounding pulse, and a general feeling of uneasiness. Ultimately there is nausea and vomiting followed by fatigue and sleepiness. The attack lasts for one-half to four hours depending on the amount of alcohol ingested and the susceptibility of the individual. Sensitivity to alcohol usually occurs in about three hours after receiving Antabus. The full sensitizing effect is developed in six to twelve hours. It is manifested on an average of seven or eight minutes after the consumption of alcohol and may continue for several days after ingestion of a single dose.[6]

PHARMACOLOGY

These symptoms are thought to be due to increased concentrations of acetaldehyde since similar responses occur in animals given intravenous injections of acetaldehyde.[7] Acetaldehyde is

formed in humans after the ingestion of alcohol, being a normal intermediate in carbohydrate metabolism; however, there is a pronounced increase in its formation in patients whose alcohol tolerance is reduced by Antabus.[8] The increase may be of such a magnitude as to be detectable (intense pungent odor of acetaldehyde) in the expired breath. It is suspected that the rise in blood acetaldehyde concentration is due to the incomplete combustion of alcohol dehydrogenase, found in the liver.[9] Animal studies have shown that this increase may be as much as five to ten times that produced by an equivalent dose of alcohol alone.[1,7]

TOXICOLOGY

The toxicity of Antabus is an open question at the present time. Although animal studies and clinical trials in Scandanavian and other northern European countries suggest that it is relatively non-toxic, more evidence must be advanced on this point before Antabus can be considered acceptable for unlimited prescription use in this country. Over twenty-five years ago Hanzlik and Irvine found the minimum fatal dose of tetraethylthiuram disulfide for rabbits to be 3 Gm./kg.[10] This is equivalent to approximately one-half pound by mouth for an average man, provided humans possess a similar resistance to the chemical. More recently Brieger reported that repeated feedings to animals produced functional disturbances, degenerative and inflammatory changes in the liver and kidney, and deposits of fine particles in the liver, spleen and bone marrow.[11]

Clinically, a variety of adverse effects have been noted which vary both in type and degree. Mild allergic skin reactions, manic and convulsive states, and a transient decline in sexual potency have been noted in a few cases.[1,12] A serious reaction involving convulsions followed by unconsciousness, hemiparesis and amnesia occurred in a diabetic patient.[12] Two fatalities, one complicated by concurrent treatment with a local anesthetic for a surgical procedure, have been reported on this continent and abroad.[1,13] Investigators familiar with the clinical use of the drug indicate that it should not be used to "sober-up" an alcoholic individual. Caution in the treatment of patients with cardiovascular diseases, diabetes, and disorders of the liver, kidney and blood forming organs have been suggested.[14] The nature and severity of the reaction are the basis for these warnings.

CONCLUSIONS

Although Antabus may appear to offer a short cut to a chronic and often difficult to control condition, it is not the total answer to the treatment of alcoholism. At best, its potentialities are limited to those of a valuable adjunct to established methods of managing this condition, and it could develop to be a "cure" worse than the disease itself. For example, the dependence on Antabus to the exclusion of other methods of treatment risks the loss of what improvement psychotherapy, social rehabilitation and more established control measures may have or could have produced. Again, the indiscriminate and unsupervised administration of the drug by pranksters or by well-meaning but misinformed friends or relatives, to persons under the influence of large amounts of alcohol could have serious or even fatal consequences. These considerations should not prove fatal to the future of Antabus but should be considered when weighing the relative merits of its usefulness.

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by KARL J. GOLDNER

W. HOWARD HASSLER

PARA-AMINOSALICYLIC ACID

Decarboxylation of para-aminosalicylic acid resulting in evolution of carbon dioxide presents a dispensing problem to the practicing pharmacist

PARA-AMINOSALICYLIC acid, commonly known as PAS, occurs as a light, off-shade white crystalline powder with a slight odor. This compound is also known as 4-amino-2-hydroxy-benzoic acid.

Berheim showed that benzoic and salicylic acids stimulate the respiration of the tubercle bacillus.[1] Following this observation, Lehmann introduced into the benzoic and salicylic acid molecules various chemical groups in the hope of finding a compound which might inhibit the growth and multiplication of the tubercle bacillus.[2] Over sixty derivatives were examined and PAS was found to be the most actively bacteriostatic. The effect is considerably reduced if the position on the ring of the amino group or the hydroxyl group is changed, or if the carboxyl group is replaced by another group. Lehmann showed PAS to be active *in vivo* also, and subsequent clinical studies in Sweden and later in Britain and in the United States, have shown the drug to be effective in various forms of tuberculosis. It has low toxicity, although a considerable number of cases of nausea and vomiting have been reported. The sodium salt is said to be less offensive in this respect, but it appears to be excreted faster, and therefore, larger doses must be given. The sodium salt has the taste of sodium salicylate and is unpleasant to take.

There are available on the market 0.5 gram plain tablets of PAS and 0.5 gram enteric coated tablets. After administering the plain tablets to patients at the West Tennessee Tuberculosis Hospital, nausea and vomiting occurred. It was hoped that the use of enteric coated tablets would overcome this; however, diarrhea resulted which

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was controlled by a mixture of bismuth subcarbonate, paregoric, and Kaopectate. From the solubility of the enteric coating in various solvents it appeared to be a coating of shellac, and upon observation, some patients passed these tablets through the bowel unchanged.

The free acid in the powder form is available at a much lower cost per gram than the tablets and, since the dosage is so great, price becomes an important factor. Consequently, the powder was sent to the floors where the nurse measured the dose in a teaspoon, mixed it with tomato juice and administered it to the patient. Patients soon complained of the taste, and again gastric irritation occurred. The nurses also complained of the trouble of mixing the powder with the juice and requested that the powder be suspended in a suitable vehicle in the Pharmacy and be sent to the floors in that form.

Following this request, a pint of a 10 per cent suspension of PAS in Amphojel, equivalent to 1.5 grams of PAS per tablespoonful, was sent up for trial. Somewhat less than one-half the bottle was used that day and, when the nurse opened the cabinet the following morning the bottle exploded, the contents spraying the nurse and shooting to the ceiling. This observation led to a review of the literature and to laboratory experiments.

Some hydrochloric acid was added to Amphojel, but no carbon dioxide was evolved, proving that there is no carbonate present in Amphojel and that the gas was not due to a reaction between PAS and carbonate. The gas formed in the preparation is, however, carbon dioxide, which is formed by decarboxylation. Oberweger, Seymour and Simmonite studied this decarboxylation and found PAS to be relatively unstable in solution, particularly when subjected to elevated temperature and in acid media.[3] The sodium salt however, was found to be relatively stable and solutions were boiled without marked decarboxylation. When sterilized by autoclaving, solutions of the sodium salt decomposed to the extent of about 15 per cent. It is recommended that such solutions be sterilized by filtration through the Seitz filter.

INVESTIGATIONS

One hundred cc. of a 10 per cent solution or suspension was prepared as follows and placed in a four ounce prescription bottle. Preparation No. 1 was made with bentonite magma, No. 2 with distilled water, No. 3 with 6 grams of sodium bicarbonate and distilled water, No. 4 with 0.7 gram of pectin, 0.1 cc. of concentrated Zephiran Chloride (12.8 per cent), 50 cc. of cinnamon syrup, and water to make 100 cc.

Determinations of *p*H were made and the results were as follows:

	*p*H
Amphojel	6.65
Bentonite Magma	8.40
Formula No. 1	4.43
Formula No. 2	3.95
Formula No. 3	6.90

These preparations were kept at room temperature for a week. Some carbon dioxide was given off in formulas 1, 2, and 4, but not in 3. Formula 3, however, turned darker. The preparations were then put in an oven at 38 degrees C. to simulate conditions on a hot summer day. The bottles burst as follows: No. 1 at 18 hours, No. 2 at 48 hours, and No. 4 at 36 hours. Formula No. 3 showed no evidence of gas formation when kept a week under these conditions. It was calculated that, were all the carbon dioxide released from 10 grams of PAS, it would measure approximately a liter and a half—reason enough to cause an explosion.

The behavior of the sodium salt in formula No. 3 indicates that the formation of color in the preparation is no measure of decarboxylation. Two reactions take place: the first is decarboxylation to form *meta*-aminophenol; the second is probably polymerization of the *meta*-aminophenol to form colored compounds. The second reaction is hastened by heat, light, and exposure to air.

Capsules and powders put up in parchment and glassine papers were kept at 38 degrees C. for a week without discoloration; whereas when exposed to air at room temperature, PAS gradually turns a light ivory color.

SUMMARY

PAS is unstable in acid solution, giving off carbon dioxide. The sodium salt is relatively stable, although its solutions turn brown. Capsules and powder papers are stable. A note of caution should also be added. When large doses of PAS are given, particularly to children, there is danger of systemic acidosis. This has been observed with the administration of *para*-aminobenzoic acid and can also occur with PAS unless sodium bicarbonate or some other systemic alkalizer is administered at the same time.

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THE PHARMACY

C. C. HILLMAN

It is generally agreed that the basic functions of management are those of planning, organizing and directing. What degree of technical knowledge is required of the hospital administration in order to satisfactorily perform these functions? Dr. Hillman answers this question regarding the pharmacy department.

In accomplishing its goal of service to the patient, the hospital pharmacy has close interrelationships with other departments of the hospital, the professional staff, the general public, the pharmaceutical trade and state and federal governmental agencies. The hospital administrator must have a sufficiently broad technical knowledge of pharmacy operation to enable him to understand the implications of all of these interrelationships and to insure that all of the hospital's responsibilities along these lines are fully met.

Aside from the accounting and purchasing departments, the pharmacy enjoys greater autonomy in its business operations than other departments of the hospital. This is necessarily so because of the kaleidoscopic developments in manufacturing methods, marketing, cost, storage, dispensing and use of pharmaceutical products.

The ever-changing characteristics of everything pharmaceutical reflect themselves in the purchasing practices, inventory policies, drug charges and finally in the hospital budget, and are matters, therefore, with which the administrator must keep abreast. The administrator must appreciate the economy of inventory control and rapid turnover of drug stocks, the value of a hospital formulary in minimizing duplication of therapeutically similar items, the potentialities for savings through the manufacturing department, and the necessity for accurate price control and drug billings to insure that the balance between income and expense is in accord with the fiscal policy of the hospital's governing body.

The administrator must assist in formulating and finally must approve and carry out a policy of charging for drugs consistent with the best interests of the institution.

He is responsible for the employment of conscientious, accurate and alert pharmacists, who must have had approved undergraduate training.

Because of the habit-forming characteristics of many drugs and the danger of self administration of others, federal and state laws have been enacted to govern their manufacture, sale and use. Others upon which federal taxes may be remitted to nonprofit institutions are purchased, stored and employed only under strict governmental regulation. Narcotics records must be kept and prescriptions must be filed for specified periods of time. On all of these technical matters the administrator must keep fully informed.

Service to the patient requires that there be readily available at all times the pharmaceuticals required by members of the medical staff in the modern therapeutic management of their patients. This service must extend around the clock and must provide for reserve stocks of emergency drugs in readily accessible locations at such times as the pharmacy does not remain open. It must insure appropriate labeling and storage on nursing units and in dispensaries to safeguard against careless or improper use and to conform to regulations governing the handling of poisons and narcotics.

The administrator must be on the alert against the abuse of drugs. Especially is this true in the management of ward patients where members of the resident staff may be inclined to prescribe in excessive amounts, to order drugs that may not be necessary or to employ costly drugs where inexpensive ones would serve equally well. This applies particularly to the prescribing of antibiotics.

An important responsibility of the pharmacy department is its participation in training activities. This may include the instruction of student and graduate nurses and physicians of the resident staff and conferences with groups of attending physicians interested in special phases of drug therapy. In the larger institutions it will provide graduate training for pharmacy interns and may include research activities.

While the administrator may lean heavily on his chief pharmacist for technical advice, the safety of the patient and the efficiency of the institution are ultimately his responsibilities. Only with a broad technical knowledge of all phases of hospital pharmacy operation will he be able to meet them satisfactorily.

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The activities of three specialized Pharmacy Departments are coordinated in St. Louis University Hospital. The photograph, left, shows a view of the prescription counter and dispensing area at St. Mary's Hospital, which is the general hospital of the group.

The Pharmacy Departments of

ST. LOUIS UNIVERSITY HOSPITAL

by SISTER MARY BERENICE, S.S.M.

and SISTER MARY LUDMILLA, S.S.M.

ST. LOUIS UNIVERSITY HOSPITAL comprises three units, namely Firmin Desloge Hospital, Mount St. Rose Sanatorium, and St. Mary's Hospital. It is governed by the Hospital Board composed of the regent and dean of the School of Medicine; the directors of the Departments of Internal Medicine, Gynecology and Obstetrics; the director of the Resident Staff; the general administrator of the University Hospital; and the Sister administrators of the three units. The combined bed capacity of these three units is 738 beds and 98 bassinets.

SISTER MARY BERENICE, S.S.M., is chief pharmacist at St. Mary's Hospital, St. Louis, Mo.

SISTER MARY LUDMILLA, S.S.M., is the pharmacist at Firmin Desloge Hospital, St. Louis, Mo.

The Outpatient Department is an integral part of Firmin Desloge Hospital and is administered by the same boards, committees, and individuals as those administering the hospital. The Pediatric, Psychiatric, and Occupational Therapy Departments are part of St. Mary's Hospital. Mount St. Rose Sanatorium is devoted exclusively to the care of patients with tuberculosis.

Total personnel of the Pharmacy Departments in these units includes seven full-time registered pharmacists, two part-time registered pharmacists, and six pharmacy helpers. During the year 1948, the total number of individual prescriptions filled in the three Pharmacy Departments, including Firmin Desloge Hospital, Mount St. Rose Sanatorium and St. Mary's Hospital, was

168,740 in addition to the floor stock supplies and other numerous orders for the clinics and various departments.

FIRMIN DESLOGE HOSPITAL

Firmin Desloge Hospital, opened in 1933, lifts a graceful finger of fifteen stories against the skyline of industrial St. Louis. Because of its function as an educational institution and because of its close connection with St. Louis University, it is popularly known as the *University Hospital.* It is located immediately opposite the St. Louis University School of Medicine and is joined to this building by means of a tunnel running under Grand Boulevard.

The bed capacity of this hospital is 223 beds and 28 bassinets. Several floors are used for the Outpatient Department. The hospital, although under direct management of the Sisters of St. Mary, is governed by a board of four members, two of the Sisters and two Jesuits from St. Louis University.

The Pharmacy Department is located on the ground floor with storage space directly beneath, on the service floor. It occupies a floor space of approximately 1,328 square feet. The department includes three rooms on the ground floor. One serves as an office and library and includes the built-in prescription file. Adjoining this is a large room which serves both as the dispensing and manufacturing laboratory and is equipped with all the necessary apparatus for conducting pharmaceutical operations in a moderate size hospital. A built-in autoclave and walk-in refrigerator are located in this room. Another cooler for biologicals is built in next to the large refrigerator. Adjacent to this large room is a smaller room which is used for storage space. A winding stairway leads down to the service floor, directly beneath the pharmacy proper, to another storage room for large bulk containers. The alcohol room is a separate locked storage space located also on the service floor.

In 1948 prescriptions totaling 70,051 were filled, of which 34,078 were for the Outpatient Department and the remainder for inpatients. All prescriptions, both for inpatients and outpatients, are numbered with a numbering machine and filed numerically. The Missouri Board of Pharmacy requires that the original of every prescription compounded or dispensed shall be dated, numbered, and filed in the order in which they were compounded and shall be preserved for a period of not less than five years.

Prescriptions for inpatients are received and delivered by means of an electrically operated conveyor which is sent to and from each floor by an automatic push button control. Floor supplies are replenished every morning, except on Sundays and holidays, and are also delivered by this conveyor. Narcotics are furnished on the nursing units in thirty dose quantities for which a recording sheet is sent to account for this number of doses. The nurse who receives the narcotics must sign for them. New supplies of narcotics can be obtained only after the sheet is completely filled out, giving the name of the patient, the room number, the date and time of administration, the name of the narcotic, the dose given, the name of the physician with his registry number, and the name of the nurse who administered the medicine. The sheet must then be returned to the pharmacy where it is filed. The medicine cabinets on the nursing divisions are inspected periodically by one of the registered pharmacists.

Prescriptions from the Outpatient Department are received by means of a small basket-lift from the Outpatient Admission Office located immediately above the pharmacy on the main floor. The three-check number identification system is used. The patient receives one check number when he presents his prescription to the clerk in the Outpatient Admission Office. The two corresponding check numbers are attached to the prescription by the clerk and the prescription is then sent to the Pharmacy. When the prescription is filled, the second corresponding check number is attached to the container and the medicine is then delivered by means of the basket-lift to the Outpatient Admission Office. Here it is received by the clerk who delivers it to the patient after receiving his corresponding check number. The third check number remains attached to the prescription and is filed with it for identification if needed. Prescriptions from the Outpatient Department are filed separately from the inpatient prescriptions. A complete new prescription is required for all refills in the Out-

View of built-in autoclave at Firmin Desloge Hospital. Note trays for sterilization of solutions in vials.

patient Department. This arrangement serves more than one purpose; first, it gives the intern practice in prescription writing; secondly, it keeps him informed concerning the medicine the patient is getting; and thirdly, it saves the pharmacist the time it would take to look up the number of the former prescription. A number of preparations that are frequently used are prepackaged.

The pharmacy personnel includes three full-time registered pharmacists, one part-time registered pharmacist, and three pharmacy helpers. The Sister pharmacists live in a building a few feet away from the hospital and attend to the emergency night calls. The part-time pharmacist serves also as an instructor in the St. Louis University School of Nursing, teaching both pharmacology and chemistry. In addition, this pharmacist delivers several lectures on new drugs in an advanced course in medical nursing given to graduate nurses who are working toward a degree.

An indexed literature file is maintained in the pharmacy to which the nurses, interns, medical staff, and pharmacists have access. Often an invitation is extended to the pharmacists to attend lectures given by members of the medical staff.

Manufacturing in the pharmacy is limited, due to shortage of working and storage space. A number of galenicals, especially those containing alcohol, such as Terpin Hydrate Elixir, Phenobarbital Elixir, Alkaline Aromatic Solution, etc., are manufactured in approximately five or ten gallon quantities. Tax-free alcohol is used for these preparations; consequently, they are dispensed to free patients only. This, however, necessitates keeping double stock of these items, that is, smaller quantities of these items are purchased and they are dispensed to patients who pay for their medicines. The manufacturing of large volume parenteral solutions is also limited to the preparation of procaine solutions in flasks, a few special solutions that cannot be purchased, and a number of solutions in vials. For the sterilization of solutions in vials, the Engineering Department constructed four steel trays to fit the autoclave. They can be used separately or all at one time. They hold approximately one hundred vials of 100 cc. each, or a proportionately larger number of smaller vials.

A blackboard near the autoclave is used to make memoranda of stock to be manufactured or purchased. This information is for the pharmacist in charge, who purchases all the pharmaceutical supplies.

Mt. St. Rose Sanatorium, work table to the right used for filling ward stock containers.

MOUNT ST. ROSE SANATORIUM

Mount St. Rose Sanatorium is situated in a park of twenty-five acres on an eminence overlooking the Mississippi river, at the edge of the city limits of southern St. Louis. Erected in 1900, it is the first exclusive tuberculosis sanatorium in the West, and one of the first in the United States.

This institution, which has a capacity of 135 beds, has available as consultants the personnel of the Medical and Surgical Departments of Saint Louis University, as well as cooperation of their laboratory and research facilities, and a full corps of consulting specialists in medicine and surgery. In addition, a complete Dental Department is installed and conducted by a dentist from the Dental Department of St. Louis University.

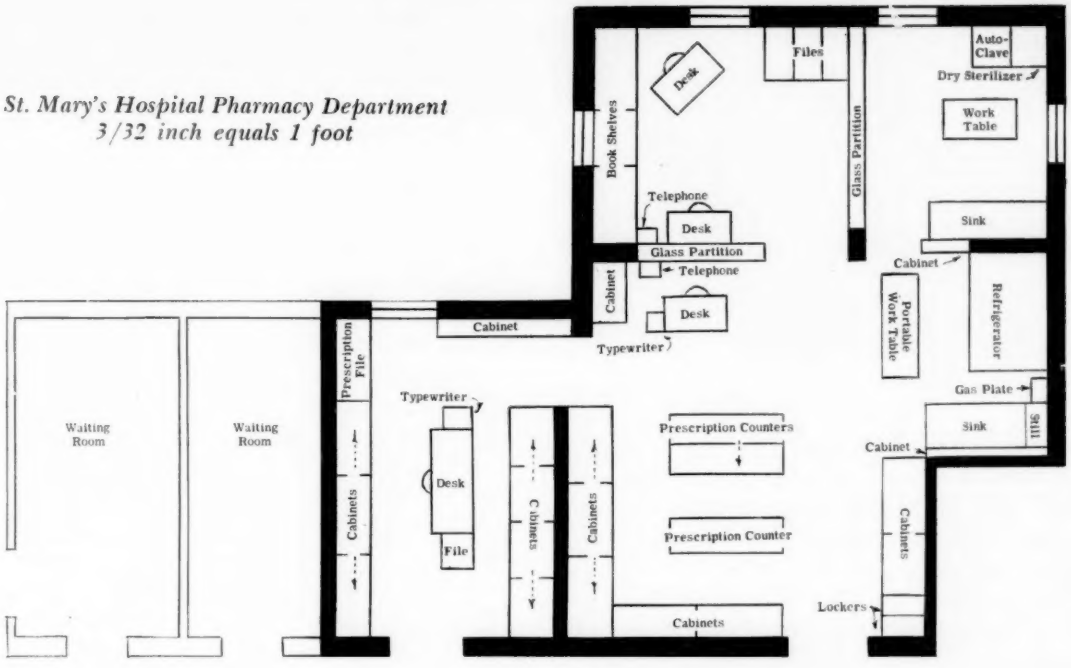
The Pharmacy is located on the main floor approximately sixty feet from the main entrance. It occupies a floor space of about 758 square feet including the storage space. It comprises two rooms, one large and one smaller room on the main floor, and storage space in the basement.

The routine for filling floor stock and supplying narcotics is practically the same as at Firmin Desloge Hospital. An electrically controlled conveyor is located in the large room by means of which medicines are delivered to the various floors. During 1948 the number of individual prescriptions filled was 15,463. One registered pharmacist, a Sister, is able to handle all of the pharmaceutical activities. The pharmacy is open for service from 7:00 A.M. to 11:40 A.M.; and again from 3:00 P.M. to 5:40 P.M.

Since the services in this institution are specialized, the pharmaceutical stock need not be as varied as in a general hospital. On the other hand, the pharmacist receives many calls for drugs, such as promizole, chaulmoogra oil, and *para*-aminosalicylic acid, which are rarely prescribed in a general hospital.

A literature file is also maintained for the use of the medical and nursing staffs.

St. Mary's Hospital Pharmacy Department
3/32 inch equals 1 foot



ST. MARY'S HOSPITAL

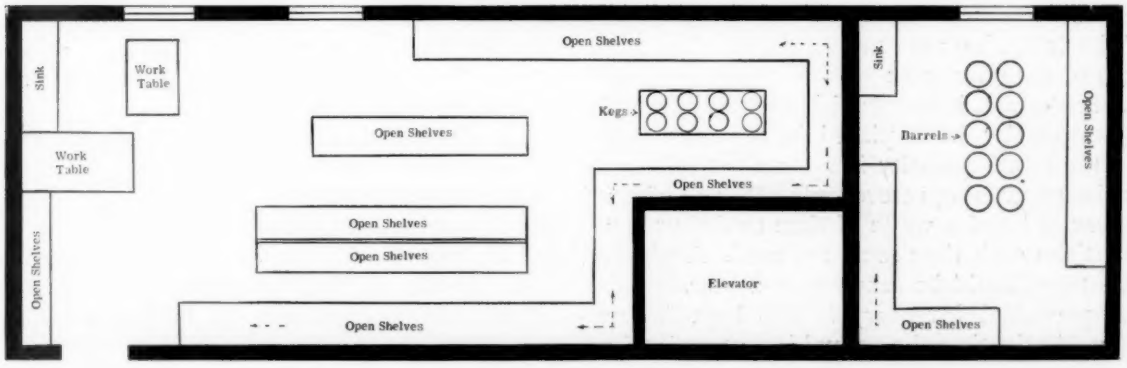
St. Mary's Hospital, located in a seventeen acre park, is a general hospital, including in its services, psychiatry, pediatrics, obstetrics, and occupational therapy. The hospital was opened in June, 1924, with 315 beds and 40 bassinets. Since that time an addition to the Psychiatric, Obstetrical, Pediatric, and Occupational Therapy Departments has increased its capacity to 380 beds and 70 bassinets. During these twenty-five years approximately 175,000 patients have been admitted, and 25,000 babies have been born at St. Mary's. It might be interesting to note the increase of admissions from 3,749 in 1925 to 13,455 in 1948.

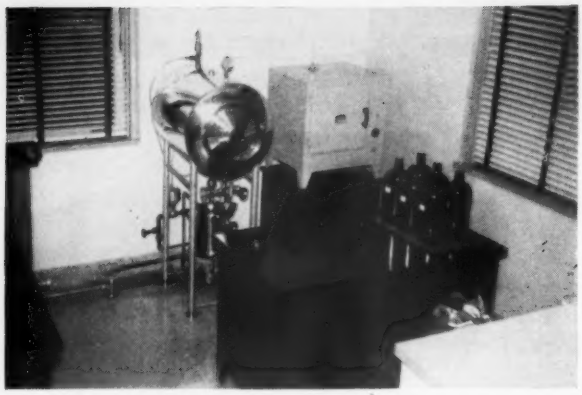
The hospital staff consists of the closed staff, made up of University faculty members, and of the semi-closed, which constitutes the courtesy staff. This year the intern and resident staff numbers fifty physicians who rotate their services among the hospitals of the University group, i.e., Firmin Desloge Hospital, Mount St. Rose Sanatorium, and St. Mary's Hospital, all conducted by the Sisters of St. Mary.

The building which serves as the residence for the students of St. Louis University School of Nursing joins St. Mary's Hospital and is connected to it by a passageway on the main floor only. The dean of the St. Louis University School of Nursing is a Sister of St. Mary.

The Pharmacy is located on the main floor about thirty feet from the main entrance. The floor space is approximately 1,350 square feet with store room space of about 1,025 square feet.

Pharmacy Store Room
3/32 inch equals 1 foot





Autoclave and dry-heat sterilizer at St. Mary's Hospital.

This store room is located two floors directly below the Pharmacy, adjoining one of the elevators. The Pharmacy proper consists of four sections. In the main room are two prescription counters, the one, a single counter, the other a double counter; thus three pharmacists can easily work without disturbing one another. In this room there is also a desk and typewriter where all the labels are typed. A telephone is near the desk. The medicine cabinets, equipped with adjustable shelves and enclosed with glass doors, are arranged along three of the walls. At one side of this room is a work table, a sink, a large refrigerator, a gas plate and a steam operated water still.

In the next section are a work table, a sink, a steam operated autoclave for sterilization of a portion of the parenteral solutions used in the hospital, and an electric, dry sterilizer for the sterilization of oils, glycerin, powder, etc. This section is separated from the first by a half wall. The third section is a separate room in which are more medicine cabinets, a desk, and several small files. The fourth section, also a separate room, is the Pharmacy Office and Library. Along the entire wall of one side of the room are built-in bookshelves. Physicians, interns, and nurses have access to this library at all times when the Pharmacy is open. The furniture consists of two desks, a typewriter, telephone, three large steel filing cabinets, and a number of small files.

The following are some of the particular features of the pharmacy:

Inventories: A perpetual inventory is kept for large quantity items placed in the store room. For the small quantity items, an entry is made on the purchasing record only. It is considered impractical and a waste of time to deduct small quantities each time some are used. A physical inventory should be taken once a year.

A perpetual inventory is also kept for narcotics. At the time the annual inventory is taken, a copy of this is made in a loose-leaf note book. This is an easy and accurate method of accounting for every dose of any narcotic. It also provides an intelligent record for the disbursements and use of narcotics for the narcotic inspector.

Literature file: An individual card is made for each piece of new literature. These cards are filed alphabetically in a three by five steel file. We have found that it is easier to use the cards, file them alphabetically, and then file the literature itself numerically, rather than to omit the cards and file the literature alphabetically. On each card is listed the number under which the piece of literature is filed, and the literature is then placed in a folder and filed numerically in the large steel file. It is also cross indexed according to any other synonym under which it could be filed. As for example, Vitamin B_{12} may be listed on the three by five card with the notation that the literature is filed under V-15. Other cards will be listed under "Cobione" and "Rubramin," with a notation on each card, "See V-15."

Index file: This file lists alphabetically the name of all items and their location in the Pharmacy and the storeroom. In this file individual cards are not used for each item, but they are listed one after the other until the card is filled. This is more convenient and a much quicker method of locating items than it would be to use the inventory card for this purpose.

Blackboard: This is used for making notations for anything to be done or to be remembered for any reason whatsoever.

Specially designed prescription files: The file consists of wooden drawers 15 inches long, 6 inches wide, and 5 inches high, with a double spindle so arranged that the prescription can be filed on the one side and flipped back on the other side of the spindle. The entire spindle can be lifted up on a bolt and turned out over the edge of the drawer while in use.

Specially designed wastebaskets: The wastebasket or container is placed in an opening in the counter enclosed by a door. The container is large enough to fit the entire space. There is an opening at the top of the door, so arranged that things can be put in the container without opening the door. Only when the container is taken out for emptying is the door opened.

At the time when St. Mary's Hospital was opened, one Sister pharmacist filled all the prescriptions and stock preparations used in the hospital. Today the hospital pharmacy staff consists of three full-time pharmacists, one part-time pharmacist, and three non-registered employees. Two pharmacy students, at various times, put in time for practical experience.

For the most part medications are dispensed on prescriptions, an average of about 235 per day. During 1948 a total of 83,226 prescriptions were filled. During 1949 the average has been a little higher. It would seem that the practice of dispensing medications on prescriptions has a definite advantage over dispensing from stock supplies only. Where the latter method is used in the hospital the pharmacist has scant opportunity to follow up the case histories of the patients whom he is serving. Not theory alone, but theory plus practical application make the pharmacist's work interesting as well as educational.

Floor stock bottles are sent to the Pharmacy before nine o'clock each morning, except on Sundays and holidays, for routine filling. Emergency stock is filled at any time. All medicines sent to the various divisions of the hospital are listed on requisition sheets and are signed by the person who receives them. This system not only serves as a record for the bookkeeping department, but also is an excellent method of preventing loss or misplacement, and delays in administering the medicines. Either a prescription or a written requisition is required for all medicines that are dispensed from the Pharmacy. Prescriptions are not filled for anyone outside of the hospital.

The Pharmacy is open from 8 A.M. until 8:30 P.M. daily, except on Sundays and holidays, when it is open from 8 A.M. until 12 noon, and again from 2 P.M. to 6 P.M. and from 8 to 8:30 P.M. There is one pharmacist on call for night emergencies; however, there are very few night calls. Lay pharmacists work 44 hours per week. One lay pharmacist lives out, and one lives in the interns' quarters. The pharmacists, residents and interns use the same dining room and take their meals at the same hours. This offers an excellent opportunity to create and maintain pleasant professional relations which are mutually beneficial.

The Sister pharmacist purchases all pharmaceutical supplies.

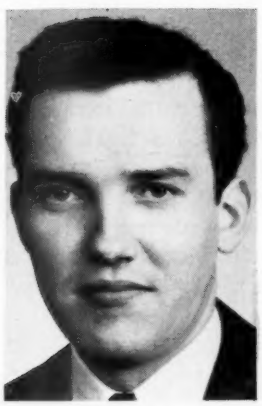
Labeling of stock bottles on the various nursing units is always done by one of the pharmacists. Stock supplies on these divisions are also periodically checked by a pharmacist.

Isopropyl alcohol is used for sterilization of skin and for other antiseptic purposes in place of ethyl alcohol. We do not use tax-free alcohol.

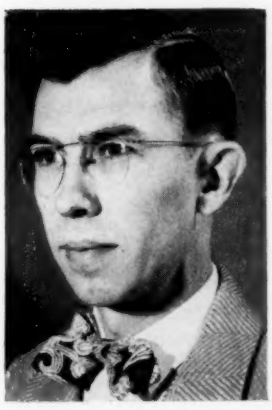
Medicine charges from the Pharmacy are sent to the bookkeeper's office daily on individual charge slips. Charges for floor stock supplies are sent to the Pharmacy once a week or before the patient leaves the hospital. These are priced by the pharmacist and sent to the bookkeeper's office. Medicine charges for patients in the obstetrical department are charged on a flat rate.

Among the projects that are being contemplated at the present time at the St. Louis University Hospital are the completion and publication of a hospital formulary, and a program for rotating internships in hospital pharmacy with a hope of extending these on the graduate level in the near future.

Additions to the BULLETIN staff . . .



BERNARD E. CONLEY comes to THE BULLETIN staff with a background in hospital pharmacy, having worked in that capacity at the Ohio State University Hospital in Columbus following a training period at Mercy Hospital in Pittsburgh. He is a graduate of Duquesne University and served in the Navy during the recent war. He now holds the rank of Lieutenant in the Medical Service Corps of the United States Naval Reserve. Prior to accepting the present position as secretary of the American Medical Association's Committee on Pesticides, Mr. Conley served as an administrative assistant of the Council on Pharmacy and Chemistry of the A.M.A. He was also a former chief of a Veterans Administration Branch Office.



A new member on the editorial staff of THE BULLETIN, MR. PAUL PARKER has already made considerable contributions to our publication. He is currently enrolled in the hospital pharmacy intern-graduate program at the University of Michigan Hospital, Ann Arbor. A native of Illinois, Mr. Parker has attended business college and served in the Navy during the recent war. He entered University of Michigan School of Pharmacy in 1946 and received his Bachelor of Science degree in 1949.

Minimum Standard Approved

THE PRESENT STATUS OF THE MINIMUM STANDARD

W. Arthur Purdum, *Chairman*
Committee on Minimum Standards

Need for higher standards for the hospital pharmacy and for the practice of pharmacy in hospitals has been recognized for a number of years. One of the principal objectives of the American Society of Hospital Pharmacists, as stated in its Constitution, is ". . . to improve and extend the usefulness of the hospital pharmacist . . . by establishing minimum standards of pharmaceutical service . . ."

As chairman of the Society's Committee on Minimum Standards, I am pleased to announce that considerable progress has been made since the former chairman, Mrs. Evlyn Scott, reported to the Society at the time of our annual convention in April 1949.

The proposed standard and its elaboration was presented originally to the Society as the 1948 report of the Committee and was published in the September-October 1948 issue of The Bulletin. The succeeding committee, under the leadership of Mrs. Scott, requested that individual members, as well as local and regional affiliated groups, study the proposals and submit their comments and criticisms to the committee. Mrs. Scott's office was virtually flooded with responses to this request——evidence of the sincere widespread interest in improving the lot of the hospital pharmacist and of hospital pharmacy. In general, the replies were highly complimentary. However, there were numerous objections to certain sections of the standard, particularly the section dealing with personnel.

On October 1, 1949 the present committee met in Baltimore, carefully weighed the suggestions submitted, and revised the standard in accordance with the best interests of hospital pharmacy. Two months later, the revision was submitted to the Executive Committee of our Society and to the Policy Committee of the Division of Hospital Pharmacy of the American Pharmaceutical Association. Both of these bodies approved the standard with only minor changes. The next step was to secure approval of the Council of the American Pharmaceutical Association, and this was accomplished at the time of its recent meeting on January 6. The Standard has now been referred to the proper accrediting agencies for study and approval.

THE PHILOSOPHY OF THE MINIMUM STANDARD

Robert P. Fischelis, *Secretary*
American Pharmaceutical Association

The philosophy of hospital standardization is well expressed by the American College of Surgeons. "The object of hospital standardization," it states, "is to promote better hospitalization in all its phases in order to give the patient the greatest benefits that medical science has to offer. Hospital standardization is a movement to encourage all hospitals to apply certain fundamental principles for the efficient care of the patient." The attempt on the part of the American Pharmaceutical Association and its affiliate, the American Society of Hospital Pharmacists, through the Division of Hospital Pharmacy which is their operating unit, to set forth a minimum standard for pharmacies in hospitals fits into the quoted definition for standardization supplied by the American College of Surgeons.

Let it be noted that the approach to the development of a minimum standard for hospital pharmacies is not an attempt to fit all hospital pharmacies into a single mold. It is well recognized that each hospital, depending on its size and specialized function, must vary its space, equipment, technics and services to suit the peculiar requirements of its clientele.

Competent committees of the American Society of Hospital Pharmacists have labored long and arduously to bring together a consensus of what constitutes good hospital pharmacy practice and the essential elements which must be united to supply the organization which will meet the needs of patients.

Out of the combined thinking and discussions of those who have put their minds to this task there has been evolved a standard which, when properly interpreted in the light of the requirements of individual organizations, may serve as a set of fundamental principles on which to build more efficient and effective pharmaceutical service for hospitals.

The six headings under which the minimum standard is described constitute a forthright statement of what a hospital pharmacy should consist, how it should be organized and integrated into the hospital organization as a whole and what should be its policies, personnel, facilities and responsibilities.

(*Continued on page 32*)

MINIMUM STANDARD FOR PHARMACIES IN HOSPITALS

1. *Organization.* There shall be a properly organized pharmacy department under the direction of a professionally competent, legally qualified pharmacist whose training in hospital pharmacy conforms to the standards herein established by the Division of Hospital Pharmacy sponsored by the American Pharmaceutical Association and the American Society of Hospital Pharmacists.

2. *Policies.* The pharmacist in charge, with the approval and cooperation of the director of the hospital, shall initiate and develop rules and regulations pertaining to the administrative policies of the department. The pharmacist in charge, with the approval and cooperation of the Pharmacy and Therapeutics Committee, shall initiate and develop rules and regulations pertaining to the professional policies of the department.

3. *Personnel.* The pharmacist in charge shall be well trained in the specialized functions of hospital pharmacy and shall be a graduate of an accredited college of pharmacy or meet an equivalent standard of training and experience as set forth in the supplement to these standards. He shall have such assistants as the volume of work in the pharmacy may dictate. These assistants shall include an adequate number of additional registered pharmacists and such other personnel as the activities of the pharmacy may require to supply pharmaceutical service of the highest quality. All members of the staff of the pharmacy shall be competent, of good moral character and mentally and physically fit to perform their duties acceptably.

4. *Facilities.* Adequate phamaceutical and administrative facilities shall be provided for the pharmacy department, including especially: *(A)* the necessary equipment for the compounding, dispensing and manufacturing of pharmaceuticals and parenteral preparations, *(B)* bookkeeping supplies and related materials and equipment necessary for the proper administration of the department, *(C)* an adequate library and filing equipment to make information concerning drugs readily available to both pharmacists and physicians, *(D)* special locked storage space to meet the legal requirements for storage of narcotics, alcohol and other proscribed drugs, *(E)* a refrigerator for the storage of thermolabile products, *(F)* adequate floor space for all pharmacy operations and the storage of pharmaceuticals at a satisfctory location provided with proper lighting and ventilation.

5. *Responsibilities.* The pharmacist in charge shall be responsible for: *(A)* the preparation and sterilization of injectible medication when manufactured in the hospital, *(B)* the manufacture of pharmaceuticals, *(C)* the dispensing of drugs, chemicals, and pharmaceutical preparations, *(D)* the filling and labeling of all drug containers issued to services from which medication is to be administered, *(E)* necessary inspection of all pharmaceutical supplies on all services, *(F)* the maintenance of an approved stock of antidotes and other emergency drugs, *(G)* the dispensing of all narcotic drugs and alcohol and the maintenance of a perpetual inventory of them, *(H)* specifications both as to quality and source for purchase of all drugs, chemicals, antibiotics, biologicals and pharmaceutical preparations used in the treatment of patients, *(I)* furnishing information concerning medications to physicians, interns and nurses, *(J)* establishment and maintenance, in cooperation with the accounting department of a satisfactory system of records and bookkeeping in accordance with the policies of the hospital for (1) charging patients for drugs and pharmaceutical supplies, (2) maintaining adequate control over the requisitioning and dispensing of all drugs and pharmaceutical supplies, *(K)* planning, organizing and directing pharmacy policies and procedures in accordance with the established policies of the hospital, (L) maintenance of the facilities of the department, *(M)* cooperation in teaching courses to students in the school of nursing and in the medical intern training program, (*N*) implementing the decisions of the Pharmacy and Therapeutics Committee, (*O*) the preparation of periodic reports on the progress of the department for submission to the administrator of the hospital.

6. *Pharmacy and Therapeutics Committee.* There shall be a Pharmacy and Therapeutics Committee, which shall hold at least two regular meetings annually and such additional meetings as may be required. The members of the committee shall be chosen from the several divisions of the medical staff. The pharmacist-in-charge shall be a member of the committee and shall serve as its secretary. He shall keep a transcript of proceedings and shall forward a copy to the proper governing authority of the hospital. The purpose of the committee shall be *(A)* to develop a formulary of accepted drugs for use in the hospital, *(B)* to serve as an advisory group to the hospital pharmacist on matters pertaining to the choice of drugs to be stocked, *(C)* to evaluate clinical data concerning drugs requested for use in the hospital, *(D)* to add to and to delete from the list of drugs accepted for use in the hospital, *(E)* to prevent unnecessary duplication in the stock of the same basic drug and its preparations and *(F)* to make recommendations concerning drugs to be stocked on the nursing units and other services.

Philosophy (*continued from p. 30*)

In the promulgation of this standard and in its implementation there must of necessity be interpretations and these have also been broadly stated as a supplement to each of the headings of the proposed minimum standard in another document which is still subject to some revision after there has been opportunity to apply the standard in a pilot study.

To date, the standard with its supplement of interpretive information, has been approved by the Policy Committee of the Division of Hospital Pharmacy, the Executive Committee of the A.S.H.P. and the Council of the A.Ph.A. The standard is now ready for approval by the American Hospital Association, the Catholic Hospital Association, the American College of Surgeons and the Council on Medical Education and Hospitals of the American Medical Association. The machinery for such approval has been set in motion and in the meantime the standard is being published as a matter of information. Elaboration of the standard will follow when the program set forth in the preceding paragraphs has been completed or is sufficiently under way to warrant further comment.

THE FIRST MINIMUM STANDARD

EDWARD SPEASE

The first Minimum Standard for Hospital Pharmacies was offered to the eighteenth annual Hospital Standardization Conference of the American College of Surgeons held in San Francisco and Oakland, California, in 1935. The standard as presented consisted of five principles.

Credit for suggesting that a Minimum Standard for Hospital Pharmacies be established goes to Dr. Malcolm T. MacEachern, formerly director of the American College of Surgeons. Preparation of the original standard was done by Edward Spease, then directing pharmacist of the University Hospitals of Cleveland, and by Robert M. Porter, then chief pharmacist. Dr. MacEachern, on visiting the pharmacy department at the University Hospitals in Cleveland in 1935, issued an invitation to prepare a standard and present it in written form at the Hospital Standardization Conference. The paper as presented at the Conference was read by Dr. Troy C. Daniels, dean of the College of Pharmacy of the University of California.

Adoption of the standard by the American College of Surgeons soon followed, and while neither Dr. MacEachern as a hospital authority, nor those of us interested, expected the adoption to have the force of law immediately, it is now apparent that the suggestions offered in the standard and the frequent publication and discussion of the principles set forth, has led to something that is permanent and good.

The standard was first developed from experience in one hospital pharmacy, and from visits to the few others then in existence. While the authors of the original Minimum Standard for Hospital Pharmacies are now in other fields, we both have a feeling of great pride at the point to which hospital pharmacy has now developed, in seeing our ideals and ideas accomplished, and we receive great pleasure from knowing the splendid young men and women now forging ahead and making hospital pharmacy a practice of which we may all be proud.

EDWARD SPEASE, formerly dean of the School of Pharmacy at Western Reserve University, now lives at M.R. 1, Wall Street, Ravenna, Ohio.

American College of Surgeons Point Rating System

Hospital pharmacists will be interested to note the point rating system upon which the American College of Surgeons bases its hospital standardization scoring report. Points are allotted for eight essential divisions and eight complementary and service divisions. The percentage of approval is based upon total points divided by the number of departments maintained. Points are allotted as follows:

			Points
1.	Physical plant		20
2.	Administration		35
3.	Medical staff organization		200
4.	Medical record department		125
5.	Clinical laboratory		95
6.	X-ray department		50
7.	Nursing service		90
8.	Dietary department		25
	Total, essential divisions		**640**
1.	Medical department		50
2.	Surgical department		100
3.	Obstetrical department		75
4.	Anesthesia department		40
5.	Physical medicine department		35
	a. Physical therapy	20	
	b. Occupational therapy	10	
	c. Rehabilitation	5	
6.	Pharmacy		20
7.	Outpatient department		20
8.	Medical social service department		20
	Total, complementary and service divisions		**360**
	GRAND TOTAL		**1,000**

PHARMACY *AND* THERAPEUTICS *COMMITTEE*

Edited by DON E. FRANCKE

In a recent opinion survey of the Society's membership, the thought was expressed that one of the most pressing problems in hospital pharmacy is the need to raise our professional standing in the eyes of administrators, physicians, and other members of the public health team. In every hospital there is one special place in which each individual chief pharmacist is potentially able to raise not only his standing with the administrative officials and the medical staff but to perform also a great service. This can be accomplished through the Pharmacy and Therapeutics Committee of which the pharmacist is a member. Some of you may say that there is no such committee in your hospital. This may be true, but there is a place for it on every hospital's chart of organization and you can easily bring about the actual formation of this committee. Of course, this is a selling job and one who has an idea to sell must have the facts readily available before he discusses the problem with either his administrator or with key members of the medical staff. There are so many advantages to the hospital and to the medical staff in the formation of an active Pharmacy and Therapeutics Committee that once the need is presented convincingly, the appointment of the committee will follow automatically. Because this committee is of such great value to pharmacists, administrators, and the medical staffs and, because I feel that pharmacists should participate more fully in such activities, this section in your publication has been started.

I know that on this subject, as well as others, perhaps too much has been written and too few tangible results follow. So everyone should bear in mind that he is the only pharmacist who can do anything in his own hospital to bring about the formation of an active committee. If some of the suggestions or ideas presented are helpful, if they stimulate some of you to take the initiative in getting your committee under way, or if they assist to some measure the committees already in existence, that will be the most which can be expected from this column. I hope it accomplishes some of these things, and from time to time as the column develops I would like to hear some of the results and experiences you have had with your committee. I want to bring your comments to the attention of the membership. It will be of great value to have statements from you telling how you introduced the idea of getting the Pharmacy and Therapeutics Committee started, some of the difficulties experienced and how they were overcome, the way the committee responded, and some of its accomplishments and the response of the medical staff to the work of the committee. Some pharmacists in small, open staff hospitals are doing a splendid job working with their committees. They are getting excellent cooperation from the staff and are accomplishing results. Many more pharmacists in this same type of hospital say that such a committee is impractical in an open staff hospital and just will not work. True, results are not the same in each hospital, but there is a level of accomplishment to which it is possible for each committee to rise. So I hope that some of you will take encouragement from others and tackle the task at hand.

THE COMMITTEE

The Pharmacy and Therapeutics Committee is a special committee of the medical staff and is appointed by the president of the staff. It reports its findings and recommendations back to the medical staff and when approved by that body, and with the consent of the administrator and the governing board of the hospital, the recommendations become the established policy of the hospital.

In all hospital organizations, one of the functions of the medical staff is to act in an advisory capacity to the governing board on professional problems, which include those of the therapeutic facilities of the pharmacy. To integrate the activities of physicians with the pharmacy, the president of the staff appoints a Pharmacy and Therapeutics Committee composed of members of the medical staff plus the chief pharmacist whose presence is essential.

Let us assume the Pharmacy and Therapeutics Committee is in existence and illustrate by example two specific recommendations this committee makes showing the channels through which they must pass and indicating the final results of these recommendations.

The committee finds that there are several instances in the hospital in which patients are being treated with drugs of unknown composition or percentage strength. The committee feels that this is a poor therapeutic practice and wishes to discourage it. Therefore, it approves a rule that "No drugs of secret composition or of unknown percentage strength will be used in the hospital." This rule is then submitted to the medical staff for approval. The staff also feels that this is a desirable rule and approves it. The approval of the medical staff then becomes a specific recommendation to the governing board of the hospital and is transmitted through the administrator. Upon the approval of the governing board, which will be greatly influenced by the opinion of the administrator, the rule forbidding the use of drugs of secret composition and percentage strength becomes the established policy of the hospital. The administrator then delegates to the chief pharmacist the responsibility to carry out this ruling and gives him the authority to act.

Now let us consider an example wherein the Pharmacy and Therapeutics Committee feels that injectible penicillin preparations should be placed on floor stock and the cost of these preparations should be covered in the room and service charge to the patient. A recommendation of this type is somewhat related to the therapeutic facilities of the pharmacy, but this aspect is overshadowed by economic implications. This recommendation is sent to the medical staff who, contrary to the opinion of the administrator and the pharmacist, also believe that such a procedure would expedite the care of the patient and so approve the suggestion. The staff transmits the recommendation through the administrator to the governing board. However, the governing board is convinced by the administrator that this would be a poor policy to establish. The chief pharmacist, acting in his role as a department head, supplies the administrator with the basic figures on the cost and volume of use of injectible penicillin preparations and indicates the probable cost of following such a policy, pointing out that increased use inevitably follows when a drug is placed as stock on the floors. Meeting with the governing board, the administrator points out that the room and service rate of the hospital would have to be greatly increased; that patients not receiving penicillin would, under such a policy still be charged for it; and that the rate per day charged in this hospital, if penicillin costs were included, would have to be far above the rates charged by other hospitals in the community. The governing board therefore vetoes the recommendation and the suggestion is over-ruled.

Thus it may be readily seen that not all recommendations of the Pharmacy and Therapeutics Committee which receive approval by the medical staff will be passed by the governing board of the hospital. But, in general, such recommendations will be approved by the board if they do not adversely affect the economic position of the hospital.

ROLE OF THE PHARMACIST

Before considering functions, let us assume there is no committee in your hospital and that you wish to have one appointed. What can you do to bring this about? Of course, the approach will vary in each hospital and it will depend somewhat upon whether the administration or the medical staff is the most cooperative. Also, it will depend greatly upon how you, the pharmacist, have done your job in the past. Those pharmacists who for years have done nothing but fill routine orders, who have shown little or no initiative, who have not made it a point to keep available the latest information on new drugs and who, in general, have not fulfilled their responsibilities as department heads, will have difficulty in selling the idea of a committee. In fact, to these pharmacists I recommend that their first step should be the overall development of their department, allowing the idea of the committee to lay dormant for at least a year. But, assuming that you have a well functioning department and have favorably impressed the medical staff and the administrator with your abilities, then you are in a position to make a beginning.

First, in order to persuade others, you must be thoroughly convinced that the appointment of this committee is highly desirable. Then, in almost all cases, the best method of approach is through the administrator. In these days of difficult budgeting, the administrator will appreciate suggestions as to how the economic situation of the hospital can be improved. The pharmacist can readily show him how, through the cooperation of a Pharmacy and Therapeutics Committee and the medical staff, appreciable savings and additional revenue may accrue to the hospital as the result of quantity purchases, by increasing the turnover of pharmaceuticals, by reducing the inventory of drugs and by increased manufacturing within the pharmacy department. It should be stressed too that the appointment of a Pharmacy Committee is one of the basic points of the *Minimum Standard For Pharmacies In Hospitals* which has been approved and strongly recommended by the American College of Surgeons. All of these factors are so familiar to pharmacists that none of you would have difficulty in expanding and developing each of the statements by examples. *(Continued on next page)*

Hospital Pharmacists Have Great Responsibility

—Glenn L. Jenkins

Every American citizen who goes to a physician's office, a clinic, a hospital, a sanitarium, nursing or convalescent home, or other center for medical care has the right to expect the highest type of professional pharmacy service. Surveys made in certain states indicate that excellent pharmaceutical service is obtained in large hospitals and in some medium sized hospitals. The same surveys indicate that our citizens receive the poorest type of pharmaceutical service in the small hospitals, sanitariums, nursing and convalescent homes, in some clinics, and in some physicians' offices.

Dr. Glenn L. Jenkins is president of the American Pharmaceutical Association and dean of the School of Pharmacy at Purdue University, Lafayette, Indiana.

It is the prime responsibility of the profession of pharmacy to see that excellent pharmaceutical service is rendered to our citizens at all times and in all places. It is the particular responsibility of the Hospital Pharmacy Division to establish the standards and seek their enforcement in all institutionalized medical care. The progress that has already been made under the wise leadership of the American Society of Hospital Pharmacists is highly commendable and deserves the wholehearted support of every person interested in the progress of pharmacy as a profession.

The recent action by the Council of the American Pharmaceutical Association through which Don E. Francke was appointed to the directorship of the Division of Hospital Pharmacy paves the way for a new era of progress. The time for action has arrived. I call on every pharmacist to unite in support of the efforts of the Division of Hospital Pharmacy and the American Society of Hospital Pharmacists to provide competent professional supervision and adequate pharmaceutical service in every institution giving medical care in our country.

Committee *(Coninued from preceding page)*

Speaking before the class in hospital administration at Northwestern University, Hans S. Hansen, formerly chief pharmacist but now administrator at Grant Hospital in Chicago, presented an example which illustrates how standardization affects inventory and turnover. Mr. Hansen said,

"Let us select B-Complex capsules for demonstration purposes. The pharmacy stocks one of the better products. For easy arithmetic we will say it costs ten dollars per thousand and still for easy arithmetic, we will say we retail it at twenty dollars per thousand. In a year's time we dispense ten of these thousands. This means on an investment of ten dollars we have taken in two hundred dollars, or in other words we have turned our stock of B-Complex capsules ten times. Now comes a member of the staff and demands brand X, B-Complex because his detailman has told him it is superior for various reasons to all other brands. So it, Brand X, is stocked. Do we dispense more because we now have two brands? No. We now have twenty dollars invested and still dispense ten bottles of a thousand each with a turnover of five. This can go on until we have any number of brands of B-Complex capsules. With the introduction of each new brand we reduce our turnover. If we extend ten brands we will not even have one turnover. This duplication is not limited to vitamins, but can occur with hundreds of other pharmaceuticals."

But the administrator will want to know also some of the ways the appointment of a Pharmacy and Therapeutics Committee can assist the medical staff. He will have to have this information if he is to talk with the president of the medical staff to convince him that such a committee should be appointed. It is also highly probable that after preliminary discussions are concluded, the president of the staff and the administrator will want to discuss the overall problem in more detail with you, the pharmacist. Thus you should prepare yourself for such a discussion and be able to present your reasons for having the committee in a concise and convincing manner, illustrating by example the many points of your presentation. However, in your initial talk with the administrator you may point out that the committee can be of value to the medical staff in several ways: by assisting in the interpretation of claims for pharmaceutical products; by helping in the evaluation of new products—are they really new or are they old drugs with new names or are they combinations with little established merit; by assigning to the pharmacist the responsibility of interviewing all medical service representatives in a preliminary way, thus saving the medical staff much time; by stimulating the establishment in the pharmacy of an information center on new as well as old drugs; by promoting more efficient pharmaceutical service to the staff and to patients; and by preparing a formulary of basic drugs for approval by the medical staff. Some of these points will be considered in more detail later.

THERAPEUTIC TRENDS

New trends in medicine and pharmacy include TERRAMYCIN—PABA—AUREOMYCIN OINTMENT—B.O.E.A.—NISENTIL—POLYMYXIN B

TERRAMYCIN

First report of a new antibiotic, Terramycin, appears in *Science* 111:85 (January 27) 1950. Preliminary clinical studies to evaluate this new antibiotic have been initiated at New York Hospital Cornell University Medical Center, New York. It is being studied to determine its effectiveness in the treatment of pneumococcal pneumonia, virus pneumonia, hemolytic streptococcal infections, staphylococcal infections, undulant fever, whooping cough, enteric and urinary tract infections and certain rickettsial diseases, such as typhus fever.

Terramycin has an extremely low toxicity according to the early experimental work on animals. On administration either orally or by injection, it is absorbed readily in the body. Oral administration is said to allow effective treatment with a minimum of discomfort to the patient.

Terramycin has been isolated from the soil from a new actinomycete, *Streptomyces rimosus.* Discovery and preliminary work on the evaluation of this new antibiotic is being carried out in the research laboratories of Chas. Pfizer and Company, Inc., Brooklyn, N.Y.

PABA IN DERMATOMYOSITIS AND SCLERODERMA

During a recent study carried out at University Hospital, Ann Arbor, Mich. to determine the effect of *para*-aminobenzoic acid (PABA) to treat lupus erythematosus, there was an opportunity to treat a patient with dermatomyositis. According to a report appearing in *Arch. Internal Med.* 85:27 (January) 1950, improvement was apparent after long therapy with PABA to treat these conditions and further clinical trials were carried out with favorable results. In addition to the patient with dermatomyositis, five cases were studied—one with features of both dermatomyositis and scleroderma which improved greatly during prolonged therapy with *para*-aminobenzoic acid, and four patients with scleroderma, three of which experienced definite benefits from similar therapy.

The mechanism of action of *para*-aminobenzoic acid is not known and further studies will be necessary to properly evaluate the effects of this therapy in treating dermatomyositis and scleroderma.

Dosages of *para*-aminobenzoic acid varied greatly in the experimental studies. The drug was administered as sodium or potassium *para*-aminobenzoate in solution. Supplies of the drug were made available for these studies by Merck & Co., Rahway, N.J. and by Wyeth, Incorporated, Philadelphia.

AUREOMYCIN OINTMENT

Recent studies have indicated the effectiveness of aureomycin as a therapeutic agent against both gram-negative and gram-positive bacterial infections, as well as against rickettsial and certain virus infections. It has further been shown that aureomycin solutions are therapeutically active when used topically in the eye, and they have been used successfully to treat a variety of bacterial and virus ocular infections. Therefore it seemed desirable to explore the possibilities of local use of aureomycin in the field of dermatology in the therapy of the pyodermas, dermatitis of various types, skin disorders of unknown etiology, and as a wound dressing following office surgical procedures. It was also believed that local application of aureomycin preparations might prove less likely to produce sensitization or allergic reactions than either a penicillin or a sulfonamide preparation, both of which frequently cause allergic reactions.

In the experimental studies reported in the *American Practitioner and Digest of Treatment* 1:54 (January) 1950, a three per cent aureomycin hydrochloride ointment compounded according to the following formula was used:

	per cent
Aureomycin Hydrochloride	3
Lanolin	10
Mineral Oil	25
White Petrolatum	62

A group of 136 patients presenting a variety of dermatologic diseases was treated. In 57 of these patients aureomycin ointment was used as a surgical dressing and was highly satisfactory in all cases. Wound healing occurred rapidly and the

resultant scars were excellent. Results were also apparently excellent in 60 of 79 unselected and variously affected patients when using aureomycin as a therapeutic agent. It was particularly beneficial when used to treat leg ulcers, vesiculopustular dermatitis of the hands, pyoderma, necrosis of the skin, pustular psoriasis, and cheilitis exfoliative.

Sensitivity to aureomycin ointment occurred in ten patients. However, it is noted that this group of patients is normally highly sensitive; no case of sensitivity developed in which aureomycin ointment was used as a surgical dressing, which may indicate its behavior on a relatively normal skin.

NEW ANTICOAGULANT

Clinical results using a new preparation, referred to as B.O.E.A., as an anticoagulant are recorded in the *British Medical Journal* (December 3) 1949. Although the authors conclude that this new therapy is a step forward toward the production of an ideal anticoagulant, it is still necessary to take the precautions advocated for this type of therapy. Prothrombin estimations should be carried out daily, in a reliable laboratory by a recognized technic before the desired level is reached, and at least every other day while the patient is under treatment. If this precaution is not followed rigorously there is a danger of hemorrhage, though this is unlikely to be severe, since the elimination of B.O.E.A. is more rapid than with dicoumarol.

Chemically, this new anticoagulant is bis-3,3′-(4-oxycoumarinyl) ethyl acetate (B.O.E.A.). Supplies of this preparation for clinical trials have been made available in England under the trade names, Pelentan and Tromexan.

Weight for weight, B.O.E.A. is about four times less active than dicoumarol, 3,3′-methylene-bis-(4-hydroxycoumarin); 100 mg. of the latter corresponding approximately in anticoagulant action with 400 mg. of the new substance. Consequently, the B.O.E.A. was used in tablets of 0.3 gram for oral administration in the clinical trials.

Results on the investigational use of B.O.E.A. in 126 patients with venous thrombosis, pulmonary emboli, arterial thrombosis, or emboli are reported. Patients were treated for periods varying from five days to ten months. In over 80 per cent of the cases given adequate dosage, the prothrombin level of the blood was reduced to under 50 per cent of normal within 36 hours of the start of treatment, and it returned to over 50 per cent of normal within the same period after withdrawal of the drug.

No gross cumulative effect of the drug was observed, although in 12 per cent of the cases the prothrombin level remained below 50 per cent of normal for periods up to four days after discontinuing the substance. No general toxic effects were observed.

NISENTIL

Comparative studies of Nisentil (NU-1196) with other obstetrical analgesics are reported in the *Am. J. Obstet. Gynec.* **58**:695 (October) 1949. Its analgesic action is compared with morphine, methadone and combinations of morphine with Prostigmine or scopolamine. Chemically, Nisentil is 1,3,dimethyl-4-phenyl-4-propionoxy piperidine hydrochloride.

Observations during the study were made by one person since it is difficult to make a clinical estimate of analgesia during labor due to numerous variable factors.

Best results were obtained when Nisentil was administered in 30 mg. doses subcutaneously, 45 per cent of the patients having good analgesia. Oral Nisentil combined with subcutaneous dosage gave a lower percentage of good results. Of the patients who received morphine and morphine-prostigmine only 19 per cent had good analgesia. Of those receiving morphine with Prostigmine, 15 per cent had good analgesia. Forty-one per cent of patients receiving methadone had good analgesia and 42 per cent of those receiving Nisentil subcutaneously in 20 mg. or less doses had good analgesia.

Nisentil for experimental studies was supplied by Hoffmann-La Roche, Inc., Nutley, N.J.

INFLUENZAL MENINGITIS TREATED WITH POLYMYXIN B

Administration of Polymyxin B (aerosporin) to a 13 month old infant with influenzal meningitis after other therapeutic measures had seemed hopeless, resulted in a complete recovery. The infectious organism (*Hemophilus influenzae*, Type B) was resistant *in vitro* to 80 units of streptomycin and partially inhibited by sulfadiazine, but was sensitive to 0.43 units per cc. of polymyxin B.

According to the study appearing in *Pediatrics*, 4:319 (September) 1949, polymyxin B was given only after the disease persisted for four weeks, during which time ordinarily adequate doses of streptomycin and sulfadiazine and the delayed administration of specific rabbit anti-influenzal serum were administered. Polymyxin B was given both intramuscularly and intrathecally. The patient recovered rapidly and future examinations revealed no neurologic or other physical defects.

Polymyxin B was supplied through the Antibiotics Study Section of the National Institutes of Health, Social Security Agency, U.S.P.H.S. by Burroughs Wellcome and Company, Inc.

ANSWERS TO QUERIES

Edited by EVLYN GRAY SCOTT, *St. Luke's Hospital, Cleveland*

ALUMINUM HYDROXIDE GEL

R. S. of Mobile, Alabama asks how to prepare an Aluminum Hydroxide suspension to be used as a gastric drip for ulcers.

ANSWER.—On page 334 of *New and Nonofficial Remedies*, 1949 edition, under the topic of "Antacids in Gastro-intestinal Drugs," Aluminum Hydroxide Gel U.S.P. is discussed. One suggested method of administration is that of "continuous drip by stomach tube in dilutions of 1 part to 2 or 3 parts of water (25 to 33⅓ per cent aluminum hydroxide gel) at the rate of 15 to 20 drops a minute for a total of approximately 1,500 cc. of diluted suspension per 24 hours."

BIOSORB

What is the advantage of Biosorb for use in the operating room for powdering gloves?

ANSWER.—Biosorb is the trade name for a brand of starch pectinate sold by Johnson and Johnson, New Brunswick, New Jersey in cans at $4.96 for 5 lbs. Vulcanized Starch is made by National Starch Products, 270 Madison Ave., New York City."

See the 1949 copy of *New and Nonofficial Remedies*, page 438 under topic "Starch-Derivative Dusting Powder"—Biosorb (Ethicon)—"As a substitute for ordinary powdered talc, it has been shown to have the advantage of biologic absorbability and is thus comparatively nonirritating and nontoxic.

WALNUT JUICE FOR VITILIGO

B. B. O. of Ohio wants to know where to obtain a walnut juice stain for coloring white spots in negroes with vitiligo.

ANSWER.—It may be obtained from the Dermatological Products Corporation, 3019 Mission Street, San Francisco 10, California.

MEDICATION BROUGHT INTO HOSPITAL

M. K. of Baytown, Tex. asks, "What, in your opinion, should be the attitude of the hospital pharmacy toward the bringing into the hospital, by a patient, medications which he has been using at home—with the intention of using such medication during his hospital stay? Probably in most large communities this would never become a problem, but in smaller communities where people feel that by bringing in their left over medication they will reduce materially the expense of hospitalization, there may develop a real problem for the hospital—especially in view of the likelihood of the medication's having been altered since it has been in the home and the fact that if a nurse were to administer such medication to the patient, she could not tell from the prescription label what it was that she was administering. Who becomes responsible for the use of such medication in the event of injury to the patient as a result of its use?"

ANSWER.—The following is the method used at St. Luke's Hospital in Cleveland: No medication is to be used by the patient without the permission of the doctor in charge, and since it would be a *very* rare occasion that medication would be left with the patient to administer himself, all the patient's medication—hospital furnished or brought in by the patient—would be at the nurse's station. The medication brought in with the patient would be checked with the physician on the case, and since he prescribed it, he would know what it was and if he wanted it continued. The name of the medication then would be written on the label, and when ordered on the chart this supply could be used as long as it lasted. We do not see that the hospital would have any responsibility for this particular medication as long as it is given according to the physician's written directions. The responsibility, we believe, would be his, and the pharmacist that filled the original prescription.

We would be interested in learning of other methods of handling this particular problem in a hospital.

AMMONIATED TOOTH POWDERS OR MOUTH RINSES

E. S. of Cleveland asks what is considered a safe ammoniated compound for tooth powders or mouth rinses?

ANSWER.—Recently accepted by the American Dental Association's Council on Dental Therapeutics are those ammoniated tooth powders marketed under license from the University of

Illinois Foundation. These contain urea (carbamide), 3 per cent; dibasic ammonium phosphate, 5 per cent; bentonite, 5 per cent; calcium carbonate and other abrasives commonly used in dentifrices, about 85 per cent; flavors and detergents. Various detergents are employed such as sodium alkyl sulfate, sodium alkyl sulfoacetate and sulfocolaurate. The licensed brands include Amurol, Colgate, Craig-Martin, Dy-Basik, Ingram, Kolynos, Dr. Lyon's, McKesson's, Orlis, Peb-Ammo, Pepsodent and Sparkle.

The following is a formula that appeared in *The Journal of the American Dental Association*, **36**:504 (June) 1948.

RINSE

Dibasic Ammonium Phosphate	50.0 Gm.
Carbamide	30.0 Gm.
Glycerin	100.0 cc.
Alcohol	40.0 cc.
Soluble Saccharin	1.0 Gm.
Menthol	0.4 Gm.
Amaranth Solution, U.S.P.	2.0 cc.
Sodium Benzoate	1.0 Gm.
Distilled Water, to make	1000.0 cc.

POWDER

Dibasic Ammonium Phosphate	50.0 Gm.
Carbamide	30.0 Gm.
Bentonite	50.0 Gm.
Calcium Carbonate (ppt.)	866.0 Gm.
Soluble Saccharin	2.0 Gm.
Menthol	2.0 Gm.
Oil of Peppermint	2.0 cc.
Oil of Cinnamon	1.9 cc.
Oil of Wintergreen	6.0 cc.
Duponol	10.0 Gm.

GERMICIDES

G. B. Warren, Ohio asks for information pertaining to germicides that are best for hospital use.

ANSWER.—The book *Aseptic Treatment of Wounds* by Dr. Carl W. Walter, published in 1948 by Macmillan Company of New York, covers the field of sterilization in the hospital. When problems arise dealing with sterilization, this book may be consulted as a reference.

A similar question was asked some time ago and was answered in THE BULLETIN of September-October, 1947. For those who may not have noted then I am repeating it.

Under the title of "Instrument Disinfecting Solutions," M. A. Lesser in *Drug and Cosmetic Industry* **60**:180 (February) 1947 has reviewed this subject very well. The bibliography gives 49 references. Quoting from the article, "It has been proved that the only way to do a thorough job of sterilizing an instrument is to put it in an autoclave for the required length of time under proper conditions of heat and pressure. . . . The chief limitation of instrument disinfecting solutions is their inefficiency with regard to the destruction of bacterial spores. . . . The best results were obtained with formaldehyde-alcohol and borax-formaldehyde solutions, and these preparations also proved to be the least corrosive. . . . Convenience, notes McCulloch, rather than bacteriological efficiency or surgical safety, is the reason why chemical disinfection of instruments is so commonly employed."

F.D.C. LAW

Where can I obtain a copy of the Federal Food, Drug, and Cosmetic Law?

ANSWER.—From the Superintendent of Documents, Government Printing Office, Washington 25, D.C. The price is 15c each.

GRADUATED WIDE MOUTH BOTTLE

Where can a graduated wide mouth Pyrex bottle be obtained?

ANSWER.—A wide mouth graduated Pyrex bottle (2000 cc.) may be obtained from the Corning Glass Works, Corning, New York. The catalog number is 602.

CLEANING GLASS FILTERS

How do you clean fritted glass filters?

ANSWER.—The Corning Glass Company, Corning, New York has a complimentary pamphlet *Pyrex Brand Fritted Glassware* in which is stated detailed information about cleaning fritted ware. Also see reprint of this article in the January-February, 1949 issue of THE BULLETIN.

HANDLING EQUIPMENT

Where can accessories for handling drums and barrels be obtained?

ANSWER. – Morse Manufacturing Company, Inc., 122 Dickerson St., Syracuse 2, N.Y. is one company which manufactures drum, barrel, and carboy handling equipment and accessories, including drum plug wrench, drum cradle trunk, can and bottle tippers, drum faucet and others.

BINDER FOR THE BULLETIN

Who puts out a good binder for THE BULLETIN OF THE AMERICAN SOCIETY OF HOSPITAL PHARMACISTS?

ANSWER.—You should be able to obtain at local bookstores a binder which will hold a year's issues. One is made by Elbe Spring Binder Company, Alden and Ravenal Streets, Fall River, Mass. The binder is designated as number 118-A.

TIMELY DRUGS

BENODAINE . . . brand of piperoxane hydrochloride has recently been made available by Merck & Company for use in the diagnosis of hypertension-producing pheochromocytoma. An intravenous test with Benodaine has been devised whereby patients with hypertension due to a pheochromocytoma will respond with a brief but usually dramatic decrease in blood pressure. In contrast, hypertensive patients without such a tumor will show either no significant change in blood pressure or a moderate increase of short duration. Indications for the Benodaine test are as follows: (1) Routinely, to test patients who have hypertensive disease, especially of the malignant type, for the presence of a causative epinephrine-producing pheochromocytoma. (2) Pre-operatively, to investigate the possible existence of a pheochrome tumor in all hypertensive patients who are candidates for sympathectomy. (3) Routinely, when the condition of the patient and other circumstances permit, to test hypertensive patients for the presence of a pheochromocytoma prior to major surgical procedures, since the presence of this tumor adds greatly to the hazards of such operations. (4) To aid in confirming the diagnosis of pheochromocytoma in patients who have the so-called typical paroxysmal hypertension of hyperepinephrinemia.

Chemically, Benodaine is 2-(1-piperidylmethyl)-1,4-benzodioxan hydrochloride. It is an odorless, crystalline powder, freely soluble in water. Solutions are stable to light, autoclaving, and storage at room temperatures.

Dosage of Benodaine is determined by the body surface area of the patient. The recommended dose is 10 mg. of Benodaine per square meter of body surface. Thus, the usual dose for an average adult is about 15 to 20 mg. It is supplied as a sterilized 0.2 per cent solution in saline for intravenous injection. Each sealed ampul of 10 cc. contains 20 mg. of Benodaine hydrochloride.

* * *

COHISTINE . . . is the antihistaminic thenylpyramine hydrochloride, combined with dextroamphetamine sulfate, acetophenetidin and acetylsalicylic acid. Used in the treatment of the common cold, the recommended dosage of Cohistine is two tablets every four hours, not to exceed three or four doses daily. Cohistine is available in bottles of 100 and 1000 tablets from Pitman-Moore Co., Indianapolis.

* * *

CORENIL . . . is a new antihistaminic and nasal secretion depressant for use for the symptomatic relief of coryza and allergic rhinitis. It may also be used in the treatment of various types of allergy. Corenil is marketed by McNeil Laboratories, Philadelphia. Each tablet contains: Methapyrilene Hydrochloride (N.N.R.) 25 mg., Extract Belladonna, 7.5 mg., and Racemic Desoxyephedrine Hydrochloride, 1.25 mg. Dosage for adults is one or two tablets every four hours for at least three doses. Corenil is supplied in bottles of 100 and 1000.

* * *

GLUCURONE . . . a new preparation used in the treatment of arthritis is available from Commercial Solvents Corporation. The compound is glucuronolactone, the inner anhydride of glucuronic acid which is synthesized in the body and found in bone, muscle and connective tissue. It is marketed in tablet form for oral use.

Results of a recent clinical study on the use of glucuronic acid to treat rheumatic diseases appears in the *Journal Lancet* **69**:385 (November) 1949. Of the fifty cases treated, nine showed complete remission, nineteen showed major improvement, 14 minor improvement, while eight cases remained unimproved. The cases which responded best were the comparatively early cases of osteo-arthritis. Cases associated with sciatica showed dramatic results. These results are supported by additional clinical investigations with the conclusion that on an average, two-thirds of the cases with rheumatic disorders have been benefitted by the administration of glucuronolactone. In the clinical studies, glucuronic acid and its various salts have been found to be of low toxicity when administered orally or intravenously.

LACRIL . . . is an isotonic solution of methylcellulose and sodium chloride, with methylparaben as a preservative. Lacril may be used as replacement therapy for normal tears since it has the approximate tonicity and viscosity of tears. It is odorless, colorless and practically tasteless. Lacril is available in one ounce dropper bottles from Abbott Laboratories, North Chicago, Ill.

* * *

MURACIL . . . is Organon's new name for methyl thiouracil. Formerly known as Antibason, this preparation is now accepted by the Council on Pharmacy and Chemistry of the American Medical Association. It will continue to be supplied in 50 mg. tablets, bottles of 100 and 1000 tablets.

* * *

MYRINGACAINE . . . is Upjohn's name for an improved ear drop, possessing vasoconstrictor, as well as analgesic and hygroscopic properties. It is used for the relief of pain associated with myringitis. In addition to its analgesic action, Myringacaine affords further relief through its vasoconstrictor activity in relieving congestion of vascular elements, and hygroscopic activity in removing edema fluid. It may also serve as a valuable adjunct to the antibacterial agents. Myringacaine contains: ethyl aminobenzoate, 4 per cent; ephedrine hydrochloride, 0.44 per cent; and *ortho*-hydroxyphenylmercuric chloride, 0.05 per cent in a glycerin and propylene glycol base. It is available in one-half ounce dropper bottles.

* * *

ORANIXON . . . brand of mephenesin, is now available in a 500 mg. tablet from Organon. The new double strength tablet has been made available for greater convenience of administration in the treatment of neuromuscular disorders such as Parkinsonism, hemiplegia and low back pain. Oranixon is available in bottles of 100 and 1000 tablets.

* * *

PERAZIL . . . brand of chlorcyclizine hydrochloride, is a new antihistamine recently released by Burroughs Wellcome and Company. It differs chemically from other antihistaminics, being a piperazine rather than a conventional ethylenediamine compound. Perazil is indicated in those allergic conditions for which histamine antagonists are effective, including: hay fever, urticaria, vasomotor rhinitis, allergic dermatitis, drug sensitivity and seasonal asthma.

Advantages of the product are its prolonged action (it provides symptomatic relief up to 24 hours), side effects are milder and considerably less frequent than those of most antihistaminics now available, and a single dose daily is usually sufficient for most patients.

Perazil is available in compressed scored tablets of 50 mg. in bottles of 100.

* * *

THENYLENE AND DESOXYN TABLETS . . . combine Thenylene (Methapyrilene, Abbott), an antihistaminic and Desoxyn (Methamphetamine, Abbott), a cerebral stimulant. The combination is indicated for patients who may become drowsy after taking antihistaminics. The Desoxyn produces a stimulating effect on the higher cerebral centers and helps to overcome the feeling of drowsiness without affecting the antihistaminic action of Thenylene. One tablet one to four times daily is the recommended dosage. If the combination of Thenylene and Desoxyn produces insomnia when taken in late afternoon, the use of plain Thenylene is advisable for afternoon or evening doses. Tablets are available from Abbott Laboratories in bottles of 100 and 500.

* * *

THIANTOIN SODIUM . . . is Lilly's brand of Phethenylate Sodium, an anticonvulsant for the treatment of grand mal, petit mal, and psychomotor epilepsy. Its relatively low toxicity as well as the fact that it can be used to control the three forms of epilepsy, offers certain advantages over other hydantoin compounds. Mental depression or drowsiness has not been noted except in patients who were intolerant to large doses. Improvement in mentality has been a striking feature, particularly in severe cases in which other drugs have failed.

Thiantoin Sodium, (sodium 5-phenyl-5-thienyl hydantoinate), is a white, odorless, hygroscopic microcrystalline powder with a bitter taste. It is soluble in water and alcohol; aqueous solutions are alkaline in reaction. The compound is stable in dry form but undergoes gradual dissociation in aqueous solution. Its chemical structure is similar to that of diphenylhydantoin sodium.

Optimal daily dosage of Thiantoin Sodium will vary from patient to patient and is the minimal amount required to obtain satisfactory control of seizures. This should be administered orally in divided portions either before or after meals. For the majority of patients, 2 grains (0.13 Gm.) two to four times daily will be sufficient. Resistant cases may require double or triple these amounts. If the capsules cannot be given by mouth, they may be punctured and administered rectally.

Thiantoin Sodium is supplied in two and four grain capsules in bottles of 100 and 1,000 by Eli Lilly and Co., Indianapolis.

NOTES AND SUGGESTIONS

Edited by GEORGE L. PHILLIPS, *University Hospital, Ann Arbor, Michigan*

BUFFER FOR ORAL THROMBIN

The use of oral thrombin solution has shown promise in the management of patients with bleeding from the upper gastro-intestinal tract. If the thrombin is to function, it is necessary to neutralize the hydrochloric acid in the stomach. Neutralization is accomplished by using the following phosphate buffer:

PHOSPHATE BUFFER, *p*H 7.6 (M/7)	
Disodium Phosphate	20.4 Gm.
Potassium Dihydrogen Phosphate	1.95 Gm.
Distilled Water, to make	1100.0 cc.

Dissolve the potassium dihydrogen phosphate in 100 cc. of the distilled water and the disodium phosphate in a liter of distilled water, then mix the two solutions.

The most effective method of administration found is as follows: A Levin tube is passed through the nose into the patient's stomach. The stomach is then washed with buffer solution or saline, and following this, 50 cc. of M/7 phosphate buffer is introduced into the stomach. This is allowed to remain for five minutes. An additional 50 cc. of phosphate buffer is introduced, and with it 10,000 units of topical thrombin (bovine). The tube is then clamped for half an hour. During this period blood studies are made, and if the patient appears to be suffering from serious blood loss, transfusions are given. After thirty minutes the Levin tube is unclamped and slow, gentle suction is applied. For this purpose a pump with a pressure reduction valve is required so as not to exceed a suction of one foot of water. The material removed from the suction tube is observed through the glass connector. If the bleeding has stopped, the material appears finely granular and light colored. If bleeding is continuing, fresh, blood stained material is visible in the tube. If no further evidence of bleeding is present, 50 cc. of buffer solution is introduced every half hour, allowed to remain a half hour then aspirated. The buffer is applied by slow drip. This process is carried on for several days and where bleeding continues, is repeated. This use of oral thrombin was reported by Daly, B. M., et al.: Bleeding From Upper G. I. Tract, *Ann. Surg.* **129**:6, 832–839, (June) 1949.

POTASSIUM *PARA*-AMINOBENZOATE

Several recent long distance phone calls to this office regarding the preparation of Potassium PABA prompts the presentation of the following information.

PREPARATION OF POTASSIUM *PARA*-AMINOBENZOATE 10%	
Potassium Bicarbonate	100.0 Gm.
Para-Aminobenzoic acid	137.0 Gm.
Distilled Water, to make	1,750.0 cc.

Dissolve the potassium bicarbonate in 1000 cc. of distilled water, then add the PABA and let stand overnight to react. Finally, make up to 1,750 cc. with distilled water to make a 10% solution of KPABA. This preparation is then used orally.

For lupus erythematosis, dosage schedules have been set at two grams every two hours (night and day) until patient begins to show progress, then cut to four two gram doses per day.

Both *para*-aminobenzoic acid and its potassium salt are available from the B. L. Lemke Company, Inc., 248 W. Broadway, New York 13, New York.

SYNTHETIC ORGANIC CHEMICALS IN PHARMACEUTICALS

Carbide and Carbon Chemicals Corporation (U.C.C.) recently published a forty page booklet which describes very well the use of many of their synthetic organic chemicals in important solvent extraction processes, in pharmaceutical syntheses, and as vehicles or carriers for the efficient administration of medicinal drugs.

The booklet also includes the following physical properties tables:

1. Typical solvents for extractions.
2. Solubility of alkaloids in organic solvents.
3. Typical azeotropes.
4. Solubility of pharmaceuticals in propylene glycol.

You may address your requests for this booklet to the Carbide and Carbon Chemicals Corporation, 30 East 42nd Street, New York 17, New York.

PARA-AMINOSALICYLIC ACID BROCHURE

Para-aminosalicylic acid is being investigated clinically on a very large scale. While its place in the treatment of tuberculosis will not be decided for some time, it gives promise of being of considerable value. In current studies, PAS is being used alone and in conjunction with streptomycin therapy.

A rather complete compilation of the literature relating to PAS, including translations of papers available only in Swedish, has been prepared by the Calco Chemical Company. This report is presented in the form of 100 loose leaf pages. Requests for this PAS brochure should be addressed to the Pharmaceutical Department, American Cyanamid Company, Calco Chemical Division, Bound Brook, New Jersey.

NEW THIAMIN SALT

The development of thiamin mononitrate has recently been announced by Merck and Company, Inc. The following advantages over thiamin hydrochloride are claimed by the company.

1. Stability—is more stable in dry multivitamin preparations such as tablets and capsules than the hydrochloride.
2. Thiamin content — contains 3 per cent more thiamin than the hydrochloride on a molecular weight basis.
3. Reduced moisture content — maximum 1 per cent moisture versus 3 per cent for hydrochloride—Merck, or 5 per cent according to U.S.P. thiamin hydrochloride standards.

The chief disadvantage is reduced solubility in solution (2.7 Gm. per 100 Gm. water at 25°C.), the *p*H of such a solution being 6.8-7.1. Solutions with *p*H 4.0 show greater thiamin stability than neutral solutions and can be prepared with thiamin mononitrate concentrations as high as 18.6 Gm. per 100 cc. at room temperature. In preparing solutions at *p*H 4.0, approximately 2.6 cc. of normal hydrochloric acid is required for each gram of thiamin mononitrate when no other acidic or basic substances are present.

Acute oral and intravenous toxicities of thiamin mononitrate in mice and rats are essentially the same as for thiamin hydrochloride.

At the present time thiamin mononitrate is not recommended for intravenous preparations pending further developmental work.

NEW STOKES PURITY METER

A new purity testing meter for use with distilled or deionized water has been announced by the Stokes Machine Company. Apparently the Wheatstone bridge principle still applies as the meter measures purity by its direct relation to the conductivity of the water being tested.

Special glass and rubber dip cells for use in conjunction with the new purity meter are available as well as threaded cells for permanent installations in tanks or pipe-lines.

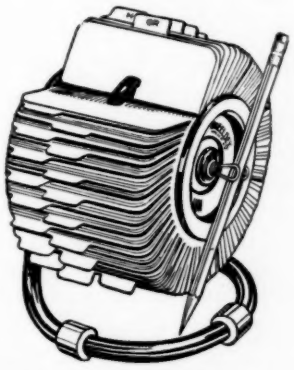
Complete information as well as prices can be obtained from the F. J. Stokes Machine Company, 5900 Tabor Road, Philadelphia 20, Pa.

CHOLINE DIHYDROGEN CITRATE FOR TABLETS

A new choline dihydrogen citrate salt is available from Chemo Puro Manufacturing Company, Long Island City, New York. This new salt enhances a controlled particle such that it may be fed directly into tablet machines along with a lubricant for the direct slugging of tablets. Finer forms of choline dihydrogen citrate already on the market may be used for making slugs but undoubtedly a controlled particle size salt would be more desirable. Chemo Puro also makes two other forms of choline dihydrogen citrate, regular for liquids and fine for capsules.

INDEXING DEVICE FOR DISPENSARY COUNTER USE

A small Wheeldex file, though occupying a space of only 7 x 7 x 8 inches, constitutes a rapid reference for information on 1000 products per file. The Wheeldex may be obtained from the Wheeldex Manufacturing Co., Inc., 40 Bank St., White Plains, N.Y. The cost of this size unit is approximately $18.00.



For dispensary use, the following information as to products available has been suggested: 1. Cost price. 2. Selling price. 3. Location. 4. Average dosage. 5. Special precautions in dispensing.

CELONS

Mrs. E. G. Scott reports that Celons may be autoclaved on the bottles and still result in a good tight seal. A time savings is found to accrue as a result of this procedure.

BOOK REVIEWS

HOSPITAL PURCHASING FILE. Edited by E. W. Jones. Pages "Classified List of Hospital Products and Services" 279; "The Planning of Equipment" 112; plus 16 sections of advertising. 8½" x 11". Purchasing Files Incorporated, 919 Michigan Avenue, Chicago 11. Twenty-seventh edition, 1949–50.

As well as any one book can condense the sprawling job of purchasing supplies for the modern hospital, *Hospital Purchasing File*, published by Purchasing Files Incorporated, with the aid of skilled advisers, does a commendable job. This book is probably worth more to the administrator or business manager than to the purchasing agent. Since it is revised yearly, it is undoubtedly more up-to-date than most surgical supply catalogs.

The hospital pharmacist-purchasing agent (a growing trend recently) will find this book a ready guide to sources of supply with which he may be unfamiliar, as a beginner in purchasing.

The book differs from its last edition chiefly in the following respects: (1) Twenty pages have been added to the "Classified List of Hospital Products and Services," (2) The classified advertisements which make up the sixteen divisions are arranged along the lines of the sixteen major departments of the hospital, the editors explain, (3) There is an additional section on "Planning the Equipment for the New General Hospital," furnished by the Division of Hospital Facilities of the U.S. Public Health Service. This contains seventeen pages of illustrative "pies" and charts, and (4) Except for Outpatient Department, the area charts of the last edition are deleted, and in their place are two articles on purchasing standards for supplies and equipment.

Worth Howard and William Forester, of Akron City Hospital, again have furnished the check lists for supplies and equipment for the several major departments of the hospital.

C. Joseph Vance

South Highlands Infirmary
Birmingham, Alabama

FORMULARY OF BETH ISRAEL HOSPITAL, New York City. Edited by the Formulary Committee, Harry Gold, M.D., Chairman. 86 pages, 4¾" x 6". Published by Beth Israel Hospital, Stuyvesant Park East, New York 3, N.Y., 1950. Price, $2.00.

This newly revised *Formulary of the Beth Israel Hospital* in New York City is published with the object of facilitating the prescribing of sound and approved medications in the clinic and wards and on the private services of the hospital. It lists approved medicinal agents and preparations as well as detailed information concerning the dosage, actions and therapeutic applications. Approximately 300 medications chosen chiefly from the U.S.P., the N.F. and N.N.R. are described. In the main text drugs are assembled in alphabetical order; however, a classification of remedies in the front of the book is based largely on that employed in *New and Nonofficial Remedies*. Classifications include the following: Agents Used in Allergy, Analgesics, Anesthetics, Autonomic Drugs, Cardiovascular Agents, Central Nervous System Stimulants, Dermatologic Preparations, Diuretics, Gastrointestinal Drugs, Genito-Urinary Medications, Hematinics, Hormones and Synthetic Substitutes, Local Anti-infectives, Agents Used in Metabolic Disorders, Miscellaneous Therapeutic Preparations, Ophthalmic Preparations, Oxytocics, Respiratory Preparations, Sedatives and Hypnotics, Sera and Vaccines, Systemic Anti-infectives, Vitamins and Vitamin Preparations. An adequate index also provides further aid in this direction.

Because of the rapid advances and changes in drug therapy, the *Formulary of the Beth Israel Hospital* has been provided in loose leaflet format in a leatherette binding.

Gloria Niemeyer

American Pharmaceutical Association
Washington, D.C.

DUKE HOSPITAL FORMULARY. By I. Thomas Reamer, Ph.G. and G. S. Eadie, M.D. 82 pages, 4" x 6". Published by Duke University Hospital, Durham, N. C., 1949. Price, $1.10.

This compact and concise formulary might well serve as a guide for those contemplating the preparation of similar books. The size of the book is such that it fits readily into a coat pocket and is thus convenient to carry and use.

The formulary is a list of the drugs and stock preparations in common use on the wards at Duke University Hospital. The number of basic drugs included is extensive and represents an up-to-date armamentarium. Apparently, the philosophy behind this formulary, as is true of most

others, is to make available to the medical staff a broad list of basic drugs, but to leave the selection of specific brands of these drugs to the pharmacist. This is a practical and workable system which has been approved by the medical staffs of countless hospitals, and when approached in a cooperative spirit, yields benefits to all concerned.

The introduction contains three rules under which the Pharmacy and Therapeutics Committee operates. First, mixtures of drugs are approved only when there is evidence of a resulting therapeutic advantage over the use of simple substances. The second rule gives to the pharmacist the authority to dispense a basic drug or its preparation even though the prescription has been written for a trade name product. It excludes proprietary items not accepted by the Council on Pharmacy and Chemistry of the American Medical Association and excludes preparations of secret composition. The third rule establishes a procedure for adding to the list of drugs included in the formulary.

Also contained in the introduction are tables of equivalents of weights, measures and temperature, and a list of commonly used Latin abbreviations. There are general statements on prescription writing and narcotic prescriptions.

The book is divided into eleven main sections, including the introduction. The drugs are classified as to their action on the various systems of the body, according to their uses in specific diseases or according to their use on or in organs of the body. Thus the sections include: those drugs acting on the central nervous system, the autonomic nervous system, circulation, blood, gastrointestinal tract, and respiration; those drugs for use on the skin, the alimentary tract, and the eye, ear, nose, and throat; and those used in specific diseases.

The sections contain 409 separate listings of drugs. Included are 197 U.S.P. drugs, 20 N.F. drugs, 60 N.N.R. drugs, and 132 others. The latter are principally formulas of Duke University Hospital.

Within each principal section the drugs are further subdivided. For example, the central nervous system drugs are subdivided into analgesics, sedatives and hypnotics, stimulants, myoneural blocking agents, drugs used for diagnostic purposes, drugs used for psychic effects (placebos), and intravenous anesthetics.

In general, under each drug are included: the name of the drug, chemical name, synonyms, trade name and manufacturer, the preparations and strengths available, and the dose. Occasionally there is a statement as to the route of administration and, where indicated, cautions regarding the use of the drug are included.

A valuable feature of the book is a well prepared index.

The few errors contained in the book are too trivial to mention.

This book is recommended for those who contemplate preparation of a similar formulary.

DON E. FRANCKE

University Hospital
Ann Arbor, Michigan

TECHNIC OF MEDICATION. By Austin Smith, M.D. Pages xi plus 255, with illustrations. 5″ x 7⅞″, J. B. Lippincott Company, Philadelphia, 1948. Price, $4.00.

This book, a member of the Lippincott "Essential" series, is a revision of the book, *General Technic of Medication,* written by the late Bernard Fantus and published by the American Medical Association. The author of the revision, Dr. Austin Smith, has retained the Fantus style of presentation, but has brought the total subject matter up to date in a clear, forthright manner. In the opinion of this reviewer, *Technic of Medication* may be considered a handbook, a good handbook. It would appear to be the author's intent to achieve this impression. It is replete with useful information about the use of drugs, and diagnostic and therapeutic tools. The scope of the book is surprising; its contents range from the philosophy of a prescription to a description of the technic for cardiac puncture, from postal regulations pertaining to drugs, chemicals and laboratory specimens to the removal, cleansing and sterilization of rubber gloves. The book does not profess to be a treatise on therapy, but presents a mass of information on nondescript but related subject matter, a knowledge of which is essential to the success of therapy. Neither does the book profess to be a treatise on pharmacy, but contains a wealth of pharmaceutical information. The same may be said for dentistry and nursing.

This book contains working information about the health professions in general and in abundance, but the type of information defies classification. One would almost like to see the expression, "Useful Hints" somewhere in the title, except that such might detract from the dignity of the publication. The book was written as a guide for physicians; it fulfills a need in a definite area. This work should prove of value to not only medical students and physicians but also, to any of the professional groups working with the sick in the hospital environment. The book is recommended as "required reading" for the intern in hospital pharmacy.

DONALD A. CLARKE

Cornell Medical College
New York City

the Veterans Administration

PHARMACIST

Edited by EDDIE WOLFE, *Mt. Alto Veterans Hospital, Washington, D.C.*

The following article is the first of a series of three articles describing operations of the three sections of the Pharmacy Division, Department of Medicine and Surgery, Veterans Administration Central Office, Washington, D.C.

PHARMACY TRAINING SECTION IN VETERANS ADMINISTRATION

CHARLES SCHWARTZ

The Pharmacy Division, Veterans Administration Central Office, Washington D.C., under direction of the Chief Medical Director has overall administrative, supervisory and professional responsibility for the various pharmacies operating in Veterans Administration medical activities located throughout the United States. These medical activities presently number over 200, and in view of present estimates that the peak load for hospitalization of veterans will not be reached until 1975, current and projected new construction is expected to materially increase this number of activities. The hospitals and clinics offer diversified types of patient care including the various specialties. Moreover, many of the hospitals are teaching hospitals with formal medical and dental intern and resident training programs.

Rendering the best pharmaceutical services for such a vast organization presents both a challenge and opportunity for the professional pharmacy staff. The number of professionally trained pharmacists presently involved in this over-all program is approximately 375.

In order to meet this responsibility the Pharmacy Division, Central Office, with Mr. E. Burns Geiger, Chief, is divided administratively into three sections according to the more specific phases of operation. The three sections are (1) Training, (2) Technical, and (3) Operations. The general function of the Training Section is to promote and establish programs which will keep Veterans Administration pharmacists abreast of modern trends in hospital pharmacy and offer appropriate in-service training.

While a few phases of the training program are still in the planning stage, certain activities already in operation have contributed much toward achieving the ultimate goal. The most important of these activities has been the growing attendance of Veterans Administration pharmacists at the annual Institutes on Hospital Pharmacy conducted under the auspices of the American Hospital Association with the cooperation of the American Pharmaceutical Association and the American Society of Hospital Pharmacists. More than 30 Veterans Administration pharmacists from hospitals located geographically throughout the nation attended such institutes in 1949. It has been the practice at each institute for VA pharmacists attending to hold seminars for the purpose of discussing mutual problems, internal operational procedures, and further coordinating the over-all pharmacy program. Pharmacists selected for attendance at the institutes held at Princeton, N.J., Berkeley, Calif., and Chicago were for the most part chief pharmacists in teaching, general medical and surgical hospitals. By adopting a system of rotation, it is planned to eventually make the opportunity of attending one of the institutes available to all Veterans Administration pharmacists. It is felt

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DR. SCHWARTZ is Chief of the Pharmacy Training Section, Pharmacy Division, Veterans Administration, Washington, D.C. He is a native of Seattle, Washington, and attended the University of Washington College of Pharmacy, obtaining his Ph.D. degree in 1935. While working for his degree, Dr. Schwartz was a teaching fellow at the College of Pharmacy. He entered government service in 1935 with the National Bureau of Standards, U. S. Department of Commerce, and received appointment with the Veterans Administration in 1946 as chief pharmacist of the former Branch Office at San Francisco, California. Dr. Schwartz is a major in the Medical Service Corps Reserve, U. S. Army, having served on active duty for over four years during the war.

that this type of training is most valuable in the practice of modern hospital pharmacy and will materially contribute toward operation of better and more efficient pharmacy service.

Future plans under consideration include establishment of internships at selected teaching hospitals, in-service training programs and issuance of an educational series of bulletins.

The proper initiation of these programs and necessary coordination of professional activities require periodic visits by the Central Office personnel to the various field stations. During such supervisory visits, the pharmacy service is evaluated and all possible assistance rendered to insure, so far as possible, that personnel, space, equipment and other factors in the pharmacy are adequate. Increased emphasis has been placed on the chief pharmacist's responsibilities in connection with the station Committee on Therapeutic Agents, his part in teaching and research programs, and control of medication stocked in wards and clinics. Membership and active participation in professional pharmacy organizations at national, state and local levels is encouraged. Supervisory activities of this nature serve to raise the level of service to conform with highest standards.

It is hoped that by expanding present training activities and developing plans under study, the Training Section will be able to make a positive contribution to the over-all success of the Veterans Administration pharmacy program.

CURRENT LITERATURE

Edited by SISTER MARY ETHELDREDA, *St. Mary's Hospital, Brooklyn, N.Y.*

AMERICAN PROFESSIONAL PHARMACIST

NOVEMBER, 1949—"Medical Terminology for the Pharmacist" by John J. Zugich, B.Sc. A continuation of the previous issue's presentation of medical terminology.

page 1028

DECEMBER, 1949—"Can Narcotic Distribution be More Efficient?" Describes in complete detail a time saving and efficient method of controlling, distributing and checking the use of narcotics in a hospital. Sample forms are included.

page 1116

JANUARY, 1950—"Building a Modern Pharmacy at Minimum Expense" by Dorothy E. Tobin. A complete description of the careful planning required in developing a pharmacy department in a 150 bed hospital limited by a small area and budget.

page 60

HOSPITALS

DECEMBER, 1949—"Worker Attitudes—How They May be Surveyed and Why" by Charles F. Wilinsky and Ernest M. Sable. Contains a complete questionnaire presented to employees of a hospital asking how they felt about their jobs. The results provided a new basis of personnel policies. Efficiency is now expected to improve.

page 56

HOSPITAL MANAGEMENT

DECEMBER, 1949—"The Pharmaceutical Industry and Cancer Research" by Dr. C. P. Rhoads. Describes the contributions of the pharmaceutical industry to cancer research through good general medical research and the study of cancer chemotherapy through the use of steroid hormones, nitrogen mustards and anti-metabolites.

page 68

JANUARY, 1950—"Counteracting the Increasing Cost of Hospital Medication" by Arthur T. Smithwick, Chief Pharmacist, Middlesex Hospital, Middletown, Conn. A consideration of how economy may be effected in the cost of hospital medication by the control of the three main factors: the cost of obtaining; the cost of preparing; and the cost of administering medication.

page 78

SOUTHERN HOSPITALS

JANUARY, 1950—"With the Hospital Pharmacist" —"Farmer's Daughter Eclipses Home Town Boy" by Clarissa Greene. An excellent article describing in detail the new and modern Pharmacy department at the Jackson Memorial Hospital in Miami, Fla. Mrs. Anna Dunham Thiel, the chief pharmacist who planned the new department, describes effectively the growth and progress of hospital pharmacy service in the institution in the past few years.

page 43

as the president sees it

HERBERT L. FLACK
Jefferson Hospital, Philadelphia

NOW IT CAN BE TOLD!

The secret is out regarding the directorship of the Division of Hospital Pharmacy. At the meeting of the Policy Committee of the Division and of the Executive Committee of the A.S.H.P. in December, it was unanimously recommended that Mr. Don E. Francke, chief pharmacist, University of Michigan Hospital, be appointed director of the Division of Hospital Pharmacy, serving on a part-time basis. He will also continue to edit THE BULLETIN. At the meeting of the Council of the American Pharmaceutical Association in January, this recommendation was approved. This was certainly an important step forward in the operation and functioning of the Division of Hospital Pharmacy

Many persons are going to feel that with Don Francke as director of the Division, it will signify the green light for all-out Division activity in the direction of the thirty or forty important projects that await Division initiative and action at this moment. Let us all keep calm and realize that an important step has been taken in the full implementation of the services of the Division of Hospital Pharmacy within the administrative structure of the American Pharmaceutical Association. We are one step closer to the ultimate aim of the founders of the Division—a full-time director selected from the ranks of practicing hospital pharmacists. Progress has been made in the Division, but there is still much to be done and I understand that Mr. Francke plans to concentrate on the various projects that should be given highest priority. It will not be possible to tackle every project that appears desirable this year, but despite this fact, progress will be made.

Lest we forget, we are also fortunate that Miss Gloria Niemeyer will continue as assistant director of the Division, on a full time basis, at the Washington headquarters. It is our luck that the several opportunities for a change offered to her these past years have not been strong enough to break her ties with hospital pharmacy. She has proven invaluable in my activities as president this year. I am certain Mr. Reamer will say the same thing a year from now. She has helped carry the Division through the past few rugged years and I predict that with both the director and assistant director being hospital pharmacists, there should be smooth sailing from now on.

DUES ARE DUE!

The majority of members pay their dues in January of each year, or at least are billed for dues at this time, as the anniversary of their original membership in the Society. I take this opportunity to ask each of you to be certain that you have not mislaid your statement of dues for 1950, and if you do find it or if you are not certain that dues were paid, write a check for $3.00 and send to Miss Niemeyer. (I'll let you in on a secret of mine. I want to be able to state at the Convention in May that Miss Niemeyer's and my name appeared on more Society certificates than the names of any former President-Secretary teams. If every member is not prompt in renewing membership for 1950, this will not be a fact.)

The Society cannot afford to lose even one member this year, in fact it must continue to grow. In the same sense, I believe that any pharmacist desirous of earning his livelihood in hospital practice cannot afford to lose membership in the A.S.H.P. with the many essential factors for which membership stands—a united front, a hospital pharmacist director of the Division, THE BULLETIN of our Society, etc. DUES ARE DUE NOW!

CANADIAN SOCIETY OF HOSPITAL PHARMACISTS

Our good friends to the North have been making a conscientious effort to improve and to maintain highest standards for pharmaceutical practice in Canadian hospitals. The Canadian Society of Hospital Pharmacists, in an effort to unite the thinking and activities of their prospective membership, has published a bi-monthly journal, *The Hospital Pharmacist*, of which the November-December 1949 issue concluded the second suc-

cessful year of its publication. This group has sponsored pharmacy section meetings with the several regional hospital association meetings. Looking over the list of officers of the national group and of the regional chapters of this Society, one notes the names of many persons who have attended the several Institutes on Hospital Pharmacy. It is no wonder, therefore, that the Canadian Society is contemplating holding its own Institute on Hospital Pharmacy this year. Though we all wish them success in this venture, we hope that it will not mean the exclusion of Canadian pharmacists from our own Institute to be held in Ann Arbor in June and those held in future years. We enjoy the exchange of ideas and of friendships, and who could forget the serious celebrations of "Dominion Day!"

CATHOLIC HOSPITAL ASSOCIATION INSTITUTE

It is understood that the Catholic Hospital Association plans to sponsor an Institute on Hospital Pharmacy again this year, in conjunction with its national convention. As in the past year, our Society has offered full cooperation with the C.H.A. in planning this Institute, and again we hope that this will not mean the exclusion of Catholic Sisters from the A.H.A. Institute, and vice versa, that is, we hope both meetings will find mixed groups in attendance.

COLOR IN PHARMACY

In the January 1950 issue of *Southern Hospitals,* there is a description of the new Pharmacy at the Jackson Memorial Hospital. Mrs. Anna Thiel is undoubtedly one of the happiest chief pharmacists in the country at the moment. If one reads this article and realizes the quarters from which she moved, he will understand the reasons for this attitude. Last April I had the privilege to visit with Mrs. Thiel and see the Pharmacy before the change. I heard of the plans for the new department and was most impressed with the color scheme that was proposed. I realized that Floridians can do things that persons in other parts of the nation cannot do, especially when I was told that the color scheme for the new Pharmacy would include flamingo pink, chartreuse, French gray, aqua, green, and blue.

Since my visit in April, I have been pursuing a requisition for repainting of my Pharmacy. After consultation with staff pharmacists, a color scheme was chosen. When finally the paint job was completed in January, I am certain that our "stock in trade" increased several hundred per cent. Despite a few critical appraisals from members of the nursing staff, regarding the "bilious" nature of our dispensing laboratory, we feel that we are the envy of the entire hospital with our "new face." To all of you who are in need of a new paint job for your Pharmacy, we recommend serious consideration of the value of a symphony of colors in the pharmacy, as an aid to better working conditions through more cheerful surroundings.

YOUR CONVENTION TRIP

This is possibly the last BULLETIN you will receive before leaving for the annual convention in Atlantic City, the week of April 30th. Bob Cathcart, chairman of the Convention Committee, has an interesting program arranged. You will also want to plan to attend the A.Ph.A. sections during convention week. Bob and I are hoping that you will pause awhile in Philadelphia enroute to Atlantic City, and enjoy our hospitality. We have not asked the Mayor for the keys to the City, as yet, but we plan to do so and will turn them over to one and all who can spend a day or a night with us. Bob has one of the nicest, small hospital pharmacies in this area. I think that we have one of the most colorful at the moment. Of course there are other hospital pharmacies in this area that you might want to visit, such as Nazareth Hospital, University Hospital and others. We will do our best to show you the town. If at all possible, let either of us know ahead of your arrival that you will have some free time in Philadelphia either enroute to or on returning from the convention. In that way we can plan something concrete for your enjoyment, and will make your stay as pleasant as possible.

Maybe your convention trip will by-pass Philadelphia. In that case, I would recommend you visit pharmacies at The New York Hospital in New York City, The Johns Hopkins Hospital in Baltimore, and others. Or, if you drive in, visit the Monmouth Memorial Hospital in Long Branch, not too far from Atlantic City, which has one of the more modern pharmacies in New Jersey hospitals. Whichever route you take, there must be one or more hospital pharmacies for you to visit that will be worth the time involved. Speaking from the experience of such visitations on every convention trip I have made, I would state that there is much to be gained.

Well, I'll look for you "On The Boardwalk at Atlantic City."

Sincerely,

Herbert L. Flack

A.S.H.P. AFFILIATES

The Maryland Association of Hospital Pharmacists met on Saturday, January 21 at the Franklin Square Hospital, Baltimore. The following officers were elected to serve during the coming year: President Kenneth Spangler, Johns Hopkins University Hospital; Vice-President Sister Mary Rita, Mercy Hospital; Recording Secretary Mary Ann Coleman, Franklin Square Hospital; and Corresponding Secretary Charles S. Friedman, Johns Hopkins University Hospital.

The New Jersey Society of Hospital Pharmacists held its December 15 meeting at Rutgers University, New Jersey College of Pharmacy. The guest speaker was Martin S. Ulan, Professor of Pharmacology at Rutgers College of Pharmacy. He gave an interesting and detailed account of his teaching experiences as a member of a pharmacy mission to Germany.

Officers of the New Jersey Society to be installed at the January meeting include: President Larry Pesa, St. Mary's Hospital, Passaic, N.J.; Vice-President Gabriel Roberto, Hope Dell Hospital, Patterson, N. J.; Treasurer Bertram Jones, Overbrook Hospital, Cedar Groves, N.J.; Secretary Mildred Avantario, Englewood Hospital, Englewood, N.J.

"The Administrator Views the Pharmacy" was discussed by Mr. Ray Brown, superintendent of the University of Chicago Clinics, at the January 10 meeting of the **Illinois Chapter of the American Society of Hospital Pharmacists.**

The Western Pennsylvania Society of Hospital Pharmacists held a meeting at Duquesne University on December 13. The speaker was Dr. Hugh C. Muldoon, Dean of Duquesne University School of Pharmacy, who spoke on "Japanese Pharmacy as I Saw It."

Miss Klotilda Baclawski, pharmacist at University Hospitals in Cleveland, has been elected chairman of the **Cleveland Society of Hospital Pharmacists.** She replaces Miss Alma Robertson, who has taken a position in Washington.

At the November meeting of the Cleveland Society, the members were taken on a conducted tour of the Cleveland Graphite Bronze Company.

Plans are being made to hold the annual convention of the **Southeastern Society of Hospital Pharmacists** in conjunction with the Southeastern Hospital Conference in St. Petersburg, Florida, April 5, 6, and 7. Miss Valerie Armbruster, program chairman of the Southeastern Society, is in charge of the meeting and will announce the program in the near future. Headquarters for the meeting will be at the Vinoy Park Hotel.

Forty-nine members were present at the January meeting of the **Southern California Chapter of the American Society of Hospital Pharmacists** held at Huntington Memorial Hospital in Pasadena. Included on the program was a discussion on types of hospitals, how they are formed, and their purpose as well as some of the administrative problems, by Mr. Alden B. Mills, hospital administrator at Memorial Hospital. During the business meeting plans were discussed for the chapter visiting the Don Baxter Laboratories. In the report of the Minimum Standards Committee, Mr. Towne outlined the work which is being done at the present time and indicated that plans are also being made to standardize the pharmacy course as presented by the American Association of Colleges of Pharmacy.

The Greater New York Chapter of the American Society of Hospital Pharmacists has reported regular monthly meetings during October, November and December. Committees which were appointed for the current year include the following: Program Committee, Sister M. Jeanette and Sister M. Etheldreda; Minimum Standards Committee, Sister M. Bernardine and Sister M. Blanchette; Membership Committee, Sister M. Donatus and Sister M. Ambrosia.

At the October and November meetings Sister Mary Etheldreda reviewed the topics discussed at the Institute on Hospital Pharmacy, which

was held by the Catholic Hospital Association in St. Louis in June. At the December meeting Sister Mary Etheldreda discussed "Prescriptions for Outpatients Receiving Public Assistance," as outlined by the Division of Medical Service, State Department of Welfare in the city of New York. The discussion included regulations regarding dispensing of prescriptions, types and amount of drugs approved by the Department, as well as the method of filing and submitting invoices.

Eighteen members have affiliated with the **Hospital Pharmacists of the Puget Sound Area** and the group expects to affiliate with the national Society in the near future. Plans are going forward for a pharmacy section to be held at the annual meeting of the Association of Western Hospitals meeting in Seattle, Washington, April 24-27.

A series of panel discussions was inaugurated at the November meeting of the **Wisconsin Society of Hospital Pharmacists.** Meeting at the St. Joseph's Hospital in Milwaukee on November 18, the first panel was devoted to "Hospital Drug Pricing" with Mrs. Doris Shimon acting as moderator.

At the January meeting of the Wisconsin Society, held at St. Michael's Hospital in Milwaukee, the guest speaker was Dr. Frederick Oswald. His subject was "Water Balance in Surgery," in which he covered the part plasma, albumen, and electrolytes play in maintaining proper fluid balance in various conditions.

The Texas Society of Hospital Pharmacists is making plans to participate in the annual meeting of the Texas Hospital Association meeting in Galveston on March 7. Speakers for the pharmacy section include Miss Elizabeth Klausmann, chief pharmacist, San Jacinto Memorial Hospital, Baytown, Texas, who will speak on "Proposed Minimum Standards for Hospital Pharmacies"; Mr. Walter Dinwiddie, area supervisor of field sales for Merck & Co. who will discuss "Changing Trends in Hospital Pharmacy Purchasing"; and Mr. Adelbert Briggs of the U.S. Public Health Service, Galveston, who will speak on "What Attendance at the National Pharmacy Institute Meant To Me."

Plans are going forward for the Texas Society to affiliate with the national organization. A constitution and by-laws have been approved and the Society plans to hold an annual meeting in connection with the spring seminar which will be held at the University of Texas in Austin.

The Ohio Society of Hospital Pharmacists will meet in conjunction with the Ohio Hospital Association at the Neil House in Columbus on March 23 and 24.

A panel discussion on incompatibilities with Dr. Donald Brodie as moderator was presented at the December meeting of the **Northern California Society of Hospital Pharmacists.** Subjects covered included the common difficulties encountered in aqueous solutions with emphasis on syrups, problems of suspending insoluble materials, and incompatibilities of hydro-alcoholic preparations.

Included also on the program was a discussion on the preservation of ophthalmic solutions by Mr. Jerome Yalon, and Mr. Linnet Walsh, Secretary of the California State Board of Pharmacy, discussed the new State Hypnotic Act.

Announcement of new officers of the Northern California Society to serve during 1950 is as follows: President Francis Spinelli, Southern Pacific Hospital, San Francisco; Vice-President Chase Holladay, Herrick Memorial Hospital, Berkeley; Secretary Jack Heard, University of California Hospital, San Francisco; and Treasurer Lt. Lee Thompson, Naval Hospital, Oakland.

AHA Publishes Accounting Handbook

Recognizing the pressing need for uniform and improved hospital accounting and statistical record keeping, the American Hospital Association has published a revision of its accounting manual.

Overall title of the new publication is *Handbook on Accounting, Statistics and Business Office Procedures for Hospitals.* Distribution of the first section of the handbook has been made to institutional members of the Association.

The first section takes up "Hospital Statistics and Uniform Classification of Accounts." A recommended set of uniform major statistical terms and definitions leads off the text material. Then follows four chapters on uniform classification of accounts, including balance sheet accounts, general fund income accounts, and general fund expense accounts.

Detailed accounts taken up were developed to meet the needs of a medium-size hospital. The arrangement is designed to allow expansion or contraction of the number of accounts to fit the needs of a hospital of any size or scope.

The last part of "Hospital Statistics and Uniform Classification of Accounts" has checklists of supplies, expenses and equipment—indicating to which department items should be charged.

NEWS ITEMS

Herbert Flack Speaks at A.Ph.A. Meeting

Mr. Herbert Flack, chief pharmacist at Jefferson Medical College Hospital, Philadelphia, and president of the American Society of Hospital Pharmacists, was the dinner speaker at the January meeting of the Philadelphia Branch of the A.Ph.A. Mr. Flack outlined the activities of the Division of Hospital Pharmacy of the A.Ph.A. and the A.S.H.P. as well as future plans and projects. He also reviewed the history of the practice of hospital pharmacy in the United States, pointing out the progress made through the activities of the A.S.H.P. and the A.Ph.A. during recent years.

Louis Gdalman Accepts New Position

Dr. Morris H. Kreeger, director of Michael Reese Hospital, Chicago, Ill., recently announced the appointment of Louis Gdalman as Director of Pharmacy. Mr. Gdalman takes over his new position January 1, 1950. Since 1930 Mr. Gdalman has been the assistant director of Pharmacy at St. Luke's Hospital, Chicago.

A graduate of the University of Illinois College of Pharmacy, Mr. Gdalman is senior chemistry instructor in the School of Nursing, St. Luke's Hospital and a lecturer in Pharmacology.

Mr. Gdalman has been president of the Illinois chapter of the American Society of Hospital Pharmacists since 1948. He is secretary-treasurer of the Chicago branch of the American Pharmaceutical Association and a fellow of the American Association for the Advancement of Science.

Paul Bjerke Speaks at Hospital Conference

Paul G. Bjerke, chief pharmacist at the Luther Hospital, Eau Claire, Wis., is one of the speakers at the annual Wisconsin Hospital Association Conference meeting in Milwaukee on February 16. Mr. Bjerke will discuss "How to Handle the New and Old Drugs" answering such problems as: How can inventories be held down?; Can duplication be reduced?; How can cooperation with staff doctors be encouraged in solving hospital pharmacy problems?; and public relations with detail men, who and how.

Mr. Bjerke has been active in the American Society of Hospital Pharmacists and is a member of the Hospital Advisory Council of the Wisconsin State Board of Health.

Don Francke Speaks at A.Ph.A. Branch Meeting

Mr. Don E. Francke, chief pharmacist, University Hospital, Ann Arbor, Michigan, spoke on "The Mission of the A.Ph.A. to Japan" at the January meeting of the Northwestern Ohio Branch of the American Pharmaceutical Association.

3,273,000 Prescriptions Filled in VA Hospitals in 1949

Recent announcement from the Veterans Administration reveals that 3,273,000 prescriptions were filled during 1949 by the 262 pharmacists in VA hospitals and centers. Another 1,103,000 were filled by 112 pharmacists in VA regional offices. Also, VA pharmacies supplied large quantities of routine medications to wards and clinics of surgical and medical services in hospitals.

The nation's retail pharmacists filled 641,000 prescriptions for veterans under the VA "home town" pharmacy program during 1949.

Director of Division Appointed

Appointment of Mr. Don E. Francke, chief pharmacist at University Hospital, Ann Arbor, Michigan, as director of the Division of Hospital Pharmacy is the result of recent meetings of the Policy Committee of the Division, the Executive Committee of the American Society of Hospital Pharmacists, and the Council of the American Pharmaceutical Association. Mr. Francke will serve on a part-time basis continuing to edit THE BULLETIN and directing the activities of the Division. This appointment of a hospital pharmacist as director of the Division of Hospital Pharmacy fills a need often expressed by members of the Society.

As director of the Division, Mr. Francke and Miss Gloria Niemeyer, who will continue as assistant director, will work within the administrative structure of the A.Ph.A., headed by Dr. Robert P. Fischelis, secretary and general manager. Hospital pharmacy activities concerned with the organization work, membership, assistance in editing THE BULLETIN and hospital pharmacy projects will be carried out at the A.Ph.A. headquarters under Mr. Francke's guidance.

Appointment of a hospital pharmacist as part-time director of the Division was originally proposed by the Policy Committee of the Division meeting in Washington on December 10, along with the suggestion that advertising be accepted in THE BULLETIN as a further source of revenue for carrying out the hospital pharmacy activities. The proposals were then approved by the A.S.H.P. Executive Committee meeting in Washington on December 11, and representatives of the A.S.H.P. were delegated to present the proposals to the A.Ph.A. Council. As the result, approval of the following proposals by the A.Ph.A. Council at its January 6 meeting was forthcoming:

1. That the agreement between the A.Ph.A. Council and the A.S.H.P. Executive Committee with respect to the management of the Division of Hospital Pharmacy be amended to provide for the appointment of a director of the Division of Hospital Pharmacy other than the secretary of the American Pharmaceutical Association and that such director may serve on a part-time basis.

2. That Mr. Don E. Francke be named director of the Division of Hospital Pharmacy on a part-time basis with the understanding that he will continue as editor of the A.S.H.P. BULLETIN.

3. That to supplement the A.S.H.P. annual dues, bulletin subscriptions and the routine A.Ph.A. Division appropriation and thereby provide for the services of the director of the Division and to otherwise enlarge the scope of the activities of the Division, the A.Ph.A. be requested to authorize the inclusion of advertising as approved by the editorial staff of the Society.

In connection with the statement to the A.Ph.A. Council, the Executive Committee also expressed appreciation for the interest in hospital pharmacy shown by the Association and its Council over a period of years, indicating that progress could not have been made without such cooperation.

Mr. Francke brings to the Division an unusual background in hospital pharmacy as well as experience in the Society activities and in the affairs of the A.Ph.A. He has been at the University of Michigan Hospital in Ann Arbor since 1936, having served as pharmacy intern, assistant chief pharmacist and chief pharmacist. He received the Bachelor of Science and Master of Science degrees from the University of Michigan. He has recently organized a graduate-pharmacy intern training program in collaboration with the College of Pharmacy and Graduate School of the University of Michigan.

Mr. Francke is the author of many publications in the field of pharmacy and has been editor of THE BULLETIN for six years. He is also editor of the *Formulary* of University Hospital and associate editor of *The University of Michigan Medical Bulletin.*

As a member of the Council of the A.Ph.A., he has served on various committees and often represents hospital pharmacy in various capacities. He is a consultant on hospital pharmacy to the surgeon general of the Army.

POSITIONS IN HOSPITAL PHARMACY

POSITIONS WANTED

Student interested in summer position; Miss Sophie Anaska, a student in pharmacy at the Rhode Island College of Pharmacy, Pawtuckett, R.I., is interested in a position in hospital pharmacy during the summer of 1950; prefers to be located in the East; has had experience in a drug store and also in a medical laboratory in a hospital. Inquiries may be sent to Miss Sophie Anaska, 96 Booth Avenue, Pawtuckett, R.I.

Man desires position in hospital pharmacy; now employed in a professional store filling approximately 350 prescriptions per week; has a Bachelor of Science degree in chemistry and in pharmacy. If interested, please address inquiries to the Division of Hospital Pharmacy, 2215 Constitution Avenue, N.W., Washington, D.C.

Man desires position as chief pharmacist or assistant chief pharmacist. Holds Bachelor of Science degree in Pharmacy. One year experience in drug store, one year in the Pharmacy at Hurley Hospital, Flint, Michigan, and one year internship at University of Michigan Hospital Pharmacy. Member of the American Society of Hospital Pharmacists. Thirty-one years of age, married and has two children. For further information write Mr. James Wood, University Hospital Pharmacy, Ann Arbor, Michigan.

POSITIONS OPEN

The following openings in hospital pharmacy appeared in the January issue of *The Modern Hospital*, page 206. Anyone interested in the positions should write directly to the Agency indicated. A fee is charged when positions are secured through the services of a personnel agency.

PHARMACISTS—(a) Chief; 400-bed hospital, town, 75,000, southeast. (b) Associate pharmacist; 700-bed teaching hospital; preferably one qualified to succeed chief upon his retirement. (c) To head department recently created; well established group, staff of 12 specialists; middle west. MH1-11 The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago.

PHARMACIST—Chief; 200-bed hospital; east; starting $300. Medical Personnel Exchange, Nellie A. Gealt, R.N., Director, 4707 Springfield Avenue, Philadelphia 43, Pa.

The following opening in hospital pharmacy appeared in the January issue of *Hospitals*, page 141.

PHARMACIST—125-bed Pennsylvania. Salary open. Maint.

According to a recent issue of the *Bulletin* of the *Southeastern Society of Hospital Pharmacists*, positions in hospital pharmacy are open in the following places in the Southeastern states:

Oak Ridge Hospital, Oak Ridge, Tenn., Mr. Hy Africk is chief pharmacist.

St. Mary Memorial Hospital, Knoxville, Tenn., Mrs. Harry K. Wood, Jr. is chief pharmacist.

Knoxville General Hospital, Knoxville, Tenn. This is a 500-bed hospital.

Mobile Infirmary, Mobile, Ala. Position for a pharmacist to establish the pharmacy.

Georgia Baptist Hospital, Atlanta, Ga., Miss Vivian Cato is chief pharmacist.

Holy Name of Jesus Hospital, Gadsden, Ala. Position for a pharmacist to establish the pharmacy.

N E W M E M B E R S

January 18, 1950

CALIFORNIA
Aninos, Chrisanthi, 40 Sweeny St., San Francisco
Brodie, Donald C., Univ. of Calif., College of Pharmacy, San Francisco 22 (A)
Holaday, Alfred Chase, 50 Joice, Apt. 9, San Francisco
Larrick, LeRex L., Rt. 7, Box 464, Modesto
Salomonson, Mary Workman, 415 S. Francisca, Redonda Beach (A)
Seubert, Alphonse A., 1684 Page St., San Francisco
Umimoto, Masao, 5105 Dover, Oakland

GEORGIA
Lanier, George K., 1105 Magnolia Drive, Waycross

ILLINOIS
Deardorff, Dwight Luverne, 808 S. Wood, Chicago (A)
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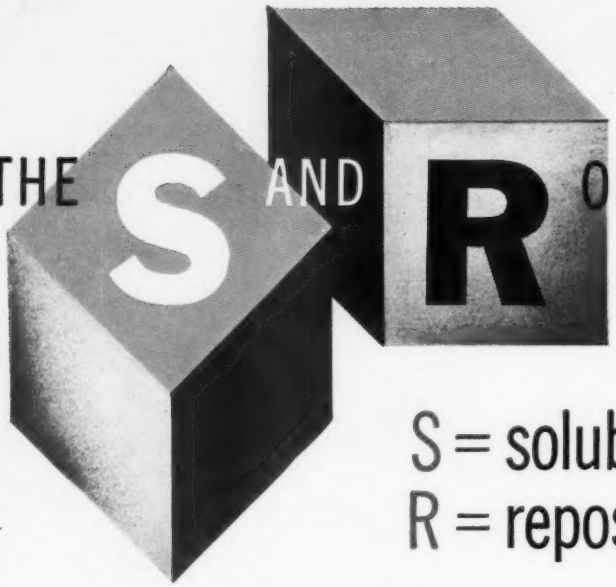

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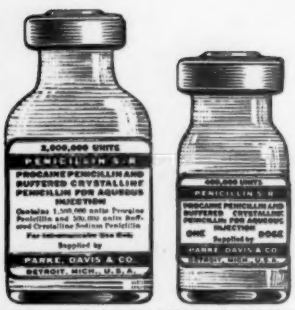

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